SAMSUNG

LASER PRINTER

ML-2550 Series

ML-2550/2551N/2552W

SERVICE Manual

LASER PRINTER

ML-2550 Series (VE-Model)

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1. Precautions

In order to prevent accidents and to prevent damage to the equipment please read the precautions listed below carefully before servicing the printer and follow them closely.

1.1 Safety Warning

(1) Only to be serviced by appropriately qualified service engineers.
High voltages and lasers inside this product are dangerous. This printer should only be serviced by a suitably trained and qualified service engineer.

(2) Use only Samsung replacement parts
There are no user serviceable parts inside the printer. Do not make any unauthorized changes or additions to the printer, these could cause the printer to malfunction and create electric shock or fire haz-ards.

(3) Laser Safety Statement
The Printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR, chapter 1 Subchapter J for Class 1(1) laser products, and elsewhere, it is certified as a Class I laser product con-forming to the requirements of IEC 825. Class I laser products are not considered to be hazardous. The laser system and printer are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance, or prescribed service condition.

Warning >> Never operate or service the printer with the protective cover removed from Laser/Scanner assembly. The reflected beam, although invisible, can damage your eyes. When using this product, these basic safety pre-cautions should always be followed to reduce risk of fire, electric shock, and injury to persons.

CAUTION - INVISIBLE LASER RADIATION WHEN THIS COVER OPEN. DO NOT OPEN THIS COVER.

VORSICHT - UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GE FFNET. NICHT DEM STRAHL AUSSETZEN.

ATTENTION - RAYONNEMENT LASER INVISIBLE EN CAS D OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.

ATTENZIONE - RADIAZIONE LASER INVISIBILE IN CASO DI APERTURA. EVITARE L ESPOSIZIONE AL FASCIO.

PRECAUCION - RADIACION LASER IVISIBLE CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.

ADVARSEL. - USYNLIG LASERSTR LNING VED BNING, N R SIKKERHEDSBRYDERE ER UDE AF FUNKTION. UNDG UDSAETTELSE FOR STR LNING.

ADVARSEL. - USYNLIG LASERSTR LNING N R DEKSEL PNES. STIRR IKKE INN I STR LEN. UNNG EKSPONERING FOR STR LEN.

VARNING - OSYNLIG LASERSTR LNING N R DENNA DEL R PPNAD OCH SP RREN R URKOPPLAD. BETRAKTA EJ STR LEN. STR LEN R FARLIG.

VARO! - AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA N KYM TT M LLE LASER-S TEILYLLE L KATSO S TEESEEN.

注 意 - 严禁渴开此盖, 以免激光泄露灼伤

주 의 - 이 덮개를 열면 레이저광에 노출될 수 있으므로 주의하십시오.

1.2 Caution for safety

1.2.1 Toxic material

This product contains toxic materials that could cause illness if ingested.

(1) If the LCD control panel is damaged it is possible for the liquid inside to leak. This liquid is toxic. Contact with the skin should be avoided, wash any splashes from eyes or skin immediately and contact your doctor. If the liquid gets into the mouth or is swallowed see a doctor immediately.

(2) Please keep toner cartridges away from children. The toner powder contained in the toner cartridge may be harmful and if swallowed you should contact a doctor.

1.2.2 Electric Shock and Fire Safety Precautions

Failure to follow the following instructions could cause electric shock or potentially cause a fire.

(1) Use only the correct voltage, failure to do so could damage the printer and potentially cause a fire or electric shock.

(2) Use only the power cable supplied with the printer. Use of an incorrectly specified cable could cause the cable to overheat and potentially cause a fire.

(3) Do not overload the power socket, this could lead to overheating of the cables inside the wall and could lead to a fire.

(4) Do not allow water or other liquids to spill into the printer, this can cause electric shock. Do not allow paper clips, pins or other foreign objects to fall into the printer these could cause a short circuit leading to an electric shock or fire hazard..

(5) Never touch the plugs on either end of the power cable with wet hands, this can cause electric shock. When servicing the printer remove the power plug from the wall socket.

(6) Use caution when inserting or removing the power connector. The power connector must be inserted completely otherwise a poor contact could cause overheating possibly leading to a fire. When removing the power connector grip it firmly and pull.

(7) Take care of the power cable. Do not allow it to become twisted, bent sharply round corners or other wise damaged. Do not place objects on top of the power cable. If the power cable is damaged it could overheat and cause a fire or exposed cables could cause an electric shock. Replace a damaged power cable immediately, do not reuse or repair the damaged cable. Some chemicals can attack the coating on the power cable, weakening the cover or exposing cables causing fire and shock risks.

(8) Ensure that the power sockets and plugs are not cracked or broken in any way. Any such defects should be repaired immediately. Take care not to cut or damage the power cable or plugs when moving the machine.

(9) Use caution during thunder or lightening storms. Samsung recommend that this machine be disconnected from the power source when such weather conditions are expected. Do not touch the machine or the power cord if it is still connected to the wall socket in these weather conditions.

(10) Avoid damp or dusty areas, install the printer in a clean well ventilated location. Do not position the machine near a humidifier. Damp and dust build up inside the machine can lead to overheating and cause a fire.

(11) Do not position the printer in direct sunlight. This will cause the temperature inside the printer to rise possibly leading to the printer failing to work properly and in extreme conditions could lead to a fire.

(12) Do not insert any metal objects into the machine through the ventilator fan or other part of the casing, it could make contact with a high voltage conductor inside the machine and cause an electric shock.

1.2.3 Handling Precautions

The following instructions are for your own personal safety, to avoid injury and so as not to damage the printer

(1) Ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall.
(2) The printer contains many rollers, gears and fans. Take great care to ensure that you do not catch your fingers, hair or clothing in any of these rotating devices.
(3) Do not place any small metal objects, containers of water, chemicals or other liquids close to the printer which if spilled could get into the machine and cause damage or a shock or fire hazard.
(4) Do not install the machine in areas with high dust or moisture levels, beside on open window or close to a humidifier or heater. Damage could be caused to the printer in such areas.
(5) Do not place candles, burning cigarettes, etc on the printer, These could cause a fire.

1.2.4 Assembly / Disassembly Precautions

Replace parts carefully, always use Samsung parts. Take care to note the exact location of parts and also cable routing before dismantling any part of the machine. Ensure all parts and cables are replaced correctly. Please carry out the following procedures before dismantling the printer or replacing any parts.

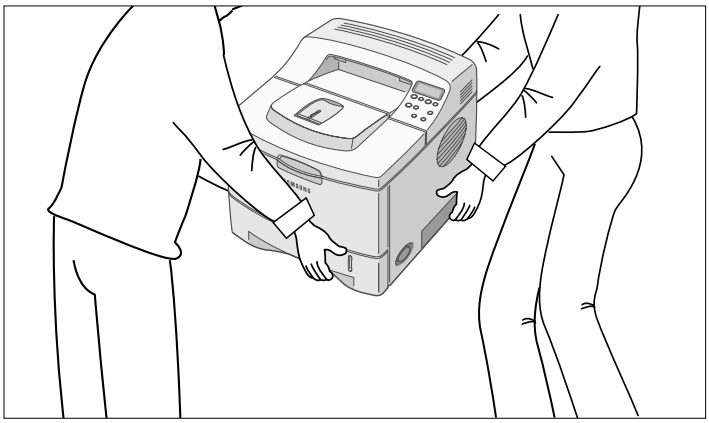
(1) Check the contents of the machine memory and make a note of any user settings. These will be erased if the mainboard or network card is replaced.
(2) Ensure that power is disconnected before servicing or replacing any electrical parts.
(3) Disconnect printer interface cables and power cables.
(4) Only use approved spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct.
(5) When removing or re-fitting any parts do not use excessive force, especially when fitting screws into plastic.
(6) Take care not to drop any small parts into the machine.
(7) Handling of the OPC Drum
- The OPC Drum can be irreparably damaged if it exposed to light.
  Take care not to expose the OPC Drum either to direct sunlight or to fluorescent or incandescent room lighting. Exposure for as little as 5 mins can damage the surface's photoconductive properties and will result in print quality degradation. Take extra care when servicing the printer. Remove the OPC Drum and store it in a black bag or other lightproof container. Take care when working with the covers(especially the top cover) open as light is admitted to the OPC area and can damage the OPC Drum.
- Take care not to scratch the green surface of OPC Drum Unit.
  If the green surface of the Drum Cartridge is scratched or touched the print quality will be compromised.

1.2.5 Disregarding this warning may cause bodily injury

(1) Be careful with the high temperature part.
The fuser unit works at a high temperature. Use caution when working on the printer. Wait for the fuser to cool down before disassembly.

(2) Do not put finger or hair into the rotating parts.
When operating a printer, do not put hand or hair into the rotating parts (Paper feeding entrance, motor, fan, etc.). If do, you can get harm.

(3) When you move the printer.
This printer weighs 17kg including toner cartridge and cassette. Use safe lifting and handling techniques. Use the lifting handles located on each side of the machine. Back injury could be caused if you do not lift carefully.



(4) Ensure the printer is installed safely.
The printer weighs 17Kg, ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall possibly causing personal injury or damaging the printer.

(5) Do not install the printer on a sloping or unstable surface. After installation, double check that the printer is stable.

1.3 ESD Precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electrostatically Sensitive (ES) Devices”, or ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor “chip” components.

The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

Caution >>Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.
3. Use only a grounded tip soldering iron to solder or desolder ESDs.
4. Use only an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.
7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.
9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

Memo

SAMSUNG

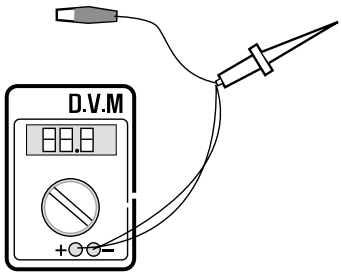
2. Reference Information

This chapter contains the tools list, list of abbreviations used in this manual, and a guide to the location space required when installing the printer. A definition of tests pages and Wireless Network information definition is also included.

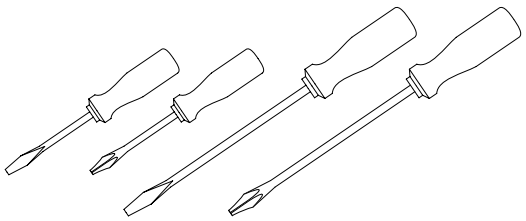
2.1 Tool for Troubleshooting

The following tools are recommended safe and easy troubleshooting as described in this service manual.

- **DVM(Digital Volt Meter)**
  Standard : Indicates more than 3 digits.



- **Driver**
  Standard : "-" type, "+" type (M3 long, M3 short, M2 long, M2 short).

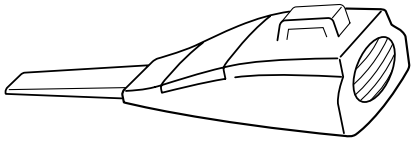


- **Tweezers**
  Standard : For general home use, small type.

- **Cotton Swab**
  Standard : For general home use, for medical service.

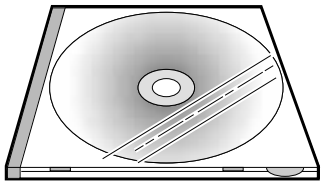
- **Cleaning Equipments**
  Standard : An IPA(Isopropyl Alcohol)dry wipe tissue or a gentle neutral detergent and lint-free cloth.

- **Vacuum Cleaner**



- **Spring Hook**
  Standard : For general use

- **Software (Driver) installation CD ROM**



2.2 Acronyms and Abbreviations

The table below explains the abbreviations and acronyms used in this service manual. Where abbreviations or acronyms are used in the text please refer to this table.

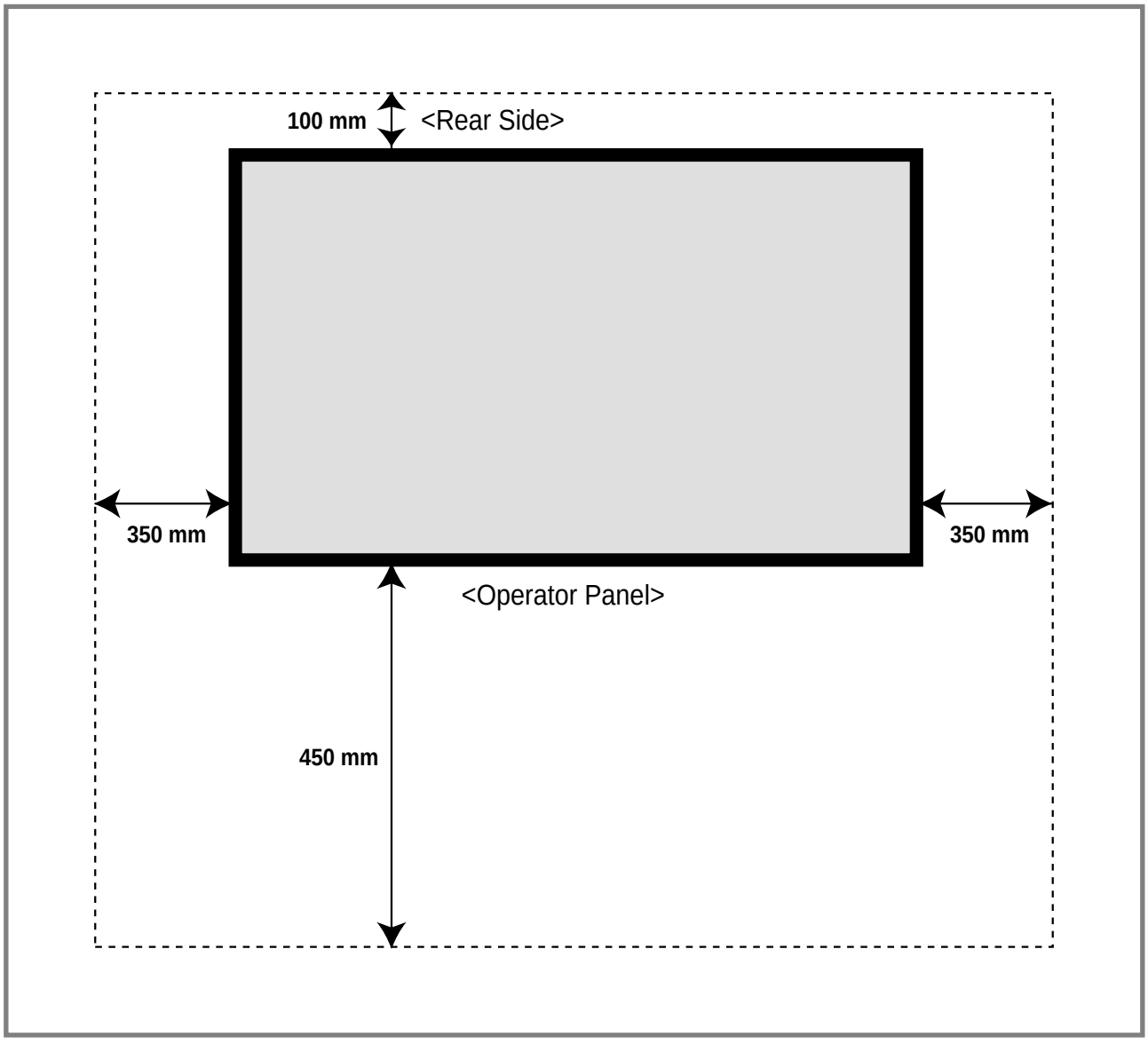
ADC	Analog-to-Digital-Conversion
AP	Access Point
AC	Alternating Current
ASIC Circuit	Application Specific Integrated
ASSY	Assembly
BIOS	Basic Input Output System
BLDC Motor	Brushless DC Motor
CMOS	Complementary Metal Oxide Semiconductor
CMYK	Cyan, Magenta, Yellow, Black
CN	Connector
CON	Connector
CPU	Central Processing Unit
CTD Sensor	Color Toner Density Sensor
dB	Decibel
dBA	A-Weighted decibel
dBm	Decibel milliwatt
DC	Direct Current
DCU	Diagnostic Control Unit
DIMM	Dual In-line Memory Module
DPI	Dot Per Inch
DRAM	Dynamic Random Access Memory
DVM	Digital Voltmeter
ECP	Enhanced Capability Port
ECU	Engine Control Unit
EEPROM	Electronically Erasable Programmable Read Only Memory
EMI	Electro Magnetic Interference
EP	Electro photographic
EPP	Enhanced Parallel Port
F/W	Firmware
FCF/FCT	First Cassette Feeder/First Cassette Tray
FISO	Front-In, Side-Out
FPOT	First Print out Time
GDI	Windows Graphic Device Interface
GIF	Graphic Interchange Format
GND	Ground
HBP	Host Based Printing
HDD	Hard Disk Drive
HTML	Hyper Text Transfer Protocol
HV	High Voltage
HVPS	High Voltage Power Supply
I/F	Interface
I/O	Input and Output
lb	Pound(s)
IC	Integrated Circuit
ICC	International Color Consortium
IDE	Intelligent Drive Electronics or Integrated Drive Electronics
IEEE	Institute of Electrical and Electronics Engineers. Inc
IOT	Image Output Terminal (Color printer, Copier)
IPA	Isopropy Alcohol
IPC	Inter Process CommunicationEPP Enhanced parallel Port
IPM	Images Per Minute
ITB	Image Transfer Belt
LAN	local area network

LBP	Laser Beam Printer
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSU	Laser Scanning Unit
MB	Megabyte
MHz	Megahertz
MPBF	Mean Prints Between Failure
MPF/MPT	Multi Purpose Feeder/Multi Purpose Tray
NIC	Network Interface Card
NPC	Network Printer Card
NVRAM	Nonvolatile Random Access Memory
OPC	Organic Photo Conductor
PBA	Printed Board Assembly
PCL	Printer Command Language , Printer Control Language
PCI	Peripheral Component Interconnect by Intel 1992/6/22, is a local bus standard developed by Intel and introduced in April, 1993 : A60, B60 Pins
PDF	Portable Document Format
PDL	Page Description Language
Ping	Packet internet or Inter-Network Groper
PPD	Postscript Printer Discription
PPM	Page Per Minute
PS	Post Script
PTL	Pre-Transfer Lamp
PWM	Pulse Width Moduration
Q'ty	Quantity
RAM	Random Access Memory
ROM	Read Only Memory
SCF/SCT	Second Cassette Feeder/Second Cassette Tray
SMPS	Switching Mode Power Supply
SPGP	Samsung Printer Graphic Processor
SPL	Samsung Printer Language
Spool	Simultaneous Peripheral Operation Online
SURF	Surface Rapid Fusing
SW	Switch
sync	Synchronous or Synchronization
T1	ITB
T2	Transfer Roller
TRC	Toner Reproduction Curve
PnP	Universal Plug and Play
URL	Uniform Resource Locator
USB	Universal Serial Bus
VCCI	Voluntary Control Council for Interference Information Technology Equipment
WECA Alliance	Wireless Ethernet Compatibility
Wi-Fi	Wireless Fidelity

2.3 Select a location for the printer

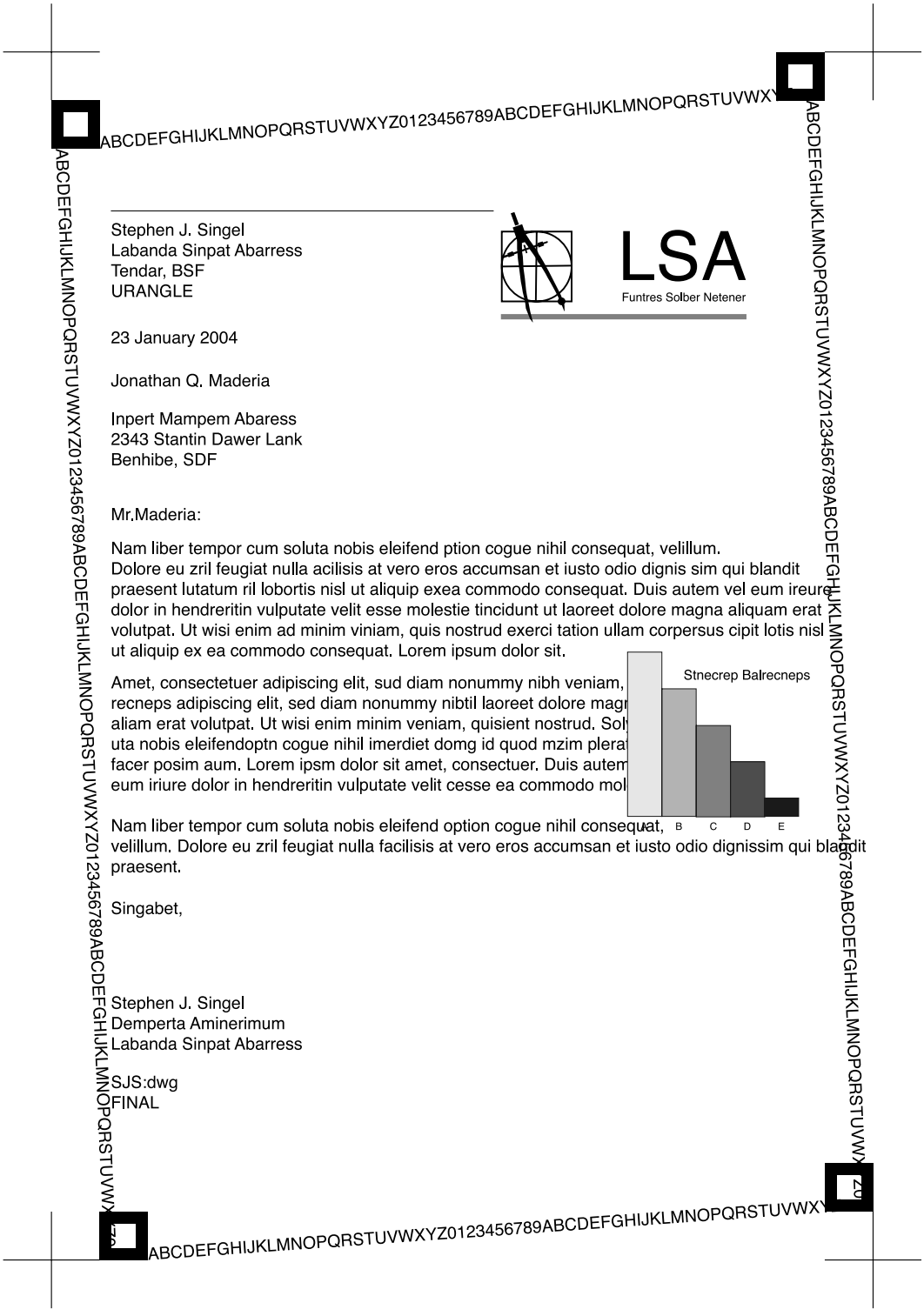
- Leave enough room to open the printer trays, covers, and allow for proper ventilation. (see diagram below)

- Provide the proper environment :
  - A firm, level surface
  - Away from the direct airflow of air conditioners, heaters, or ventilators
  - Free of extreme fluctuations of temperature, sunlight, or humidity
  - Clean, dry, and free of dust



2.4 Sample Tests Patterns

The sample patterns shown below are the standard test patterns used in the factory.
The life of the toner cartridge, developer cartridge and printing speed are measured with the pattern shown below (5%). The A4 ISO 19752 standard pattern samples are reproduced reduced to 70% of the actual A4 size.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2.5 Wireless LAN

• This product can be used with a wireless LAN (ML-2550,2551N(OPTION), ML-2552W(DEFAULT))
- The wireless LAN function uses radio technology, instead of using LAN cable, to connect to an access point for printing.
- For a wireless LAN connection in Infrastructure mode an AP is needed, (purchased separately)
- For a wireless LAN connection in Ad-Hoc mode an appropriate Wireless I/F card is required fitted to a computer, (purchased separately)
- It is possible to use a wireless LAN connection with wired LAN.
- If an AP is installed in an office or at home, the wireless LAN function can be simply configured and used.

• Types of desk top PC (or Lap top) that uses the wireless LAN.

Division	Basic type	Recommend type
CPU	Over PENTIUM 233M	PENTIUM 300MHz
MEMORY	Over 64MB	Over 128MB
VIDEO CARD	Over 800X600	Over 1024X768
OS	Over WINDOWS 98	Over WINDOWS ME
INTERFACE CARD	A product has a certificated mark of Wi-Fi™	

• About the certificated mark of Wi-Fi™

- Wi-Fi™ is a registered trademark of the WECA (Wireless Ethernet Compatibility Alliance). Over 50 wireless LAN companies are member of this organisation. Most of the main wireless networking companies are attending including such companies as Lucent Technologies, Cisco, Intel/Symbol, 3Com, Enterasys (Cabletron), Compaq, IBM, Nokia, Dell, Philips, Samsung Electronics, Sony, Intersil, etc.. This mark certifies mutual compatibility amongst the product of these companies. Wi-Fi™ (IEEE 802.1) is certified as a standard of the wireless LAN market.

3. Specifications

Product specifications are subject to change without notice.See below for product specifications.

3.1 General Specifications

ITEM	DESCRIPTION	
Print Method	Non-impact Electro-photography	
Development system	Non-Magnetic, Mono-Component Toner	
Transfer system	Conductive roller transfer	
Fuser Unit(Toner fix)	Pressure and Heating with Lamp	
*Print Speed	Up to 24 PPM in A4 size	
	Up to 25 PPM in Letter size	
Resolution	Up to 600 x 600 DPI effective output	
	Up to 1200 x 1200 DPI effective output	
Source of Light	Laser diode (LSU : Laser Scanner Unit)	
Warm-Up Time	Power-on boot : 50 seconds or less	
First Print Time	12 seconds or less	
Feed Method	Cassette & Manual , Option Feeder(SCF)	
Media Size	76mm * 128mm(3 * 5") to 216mm * 356mm(8.5 *14")	
Media Thickness	16 ~ 28 lb(60 to 105g/m^2), Manual : 16 ~43lb(60 to 163g/m^2)	
Dimension(W X D X H)	386 X 436 X 326 mm / 15.2 X 17.2 X 12.8 inch (without options)	
Weight	Net : 13.9 Kg(30.6Ib) with toner cartrige	
	Gross : 17.1 Kg(37.7Ib)	
**Acoustic Noise	Stand by : Less than 35 dB	
	Printing: Less than 53 dB	
	Sleep mode : Background Noise	
Power save mode	Enable	
Toner save mode	Enable	
Consumable Parts	Retard Roller	Up to 100,000 Pages
	Transfer Roller	Up to 100,000 Pages
	Fuser Assembly	Up to 125,000 Pages
	Toner Sensor	Yes(dot counting)
	Toner Type	Non-Magnetic Contact System
	Toner Initial	5,000 sheets@ISO 5% corerage
	Toner sale	10,000 sheets@ISO 5% corerage
Optional Parts	SCF	Paper Capacity : 500 Sheets
	Wired NPC	Ethernet 10/100 base TX
	(ML-2550:Optional ML-2551N : Basic)	Protocols : TCP/IP, SPX/IPX, Ethertalk, SNMP, HTTP1.1, DLC/LLC 8MB RAM Buffer for faster graphics performance 2MB Flash Memory for upgrade Throughput : 200 ~ 300K TCP/IP
	SDRAM DIMM	16, 32, 64, 128MB 100PIN SDRAM DIMM
	Wireless NPC (ML-2552W Basic)	IEEE802.11b supportT Speed : 11, 5.5, 2, 1 Mbps Operation range : 30m(Indoors), 150m(Outdoors)

* Print speed will be affected by Operating System used, computing performance, application software, connecting method, media type, media size and job complexity.

** Sound Pressure Level, ISO 7779

3.2 Controller Specification

ITEM	DESCRIPTION
Processor(CPU)	Power PC 350 MHz
Memory	FLASH ROM(PROGRAM +Postscript) : 2MB flash * 2
	RAM : 32MB (Expandable to 160MB)
	Option DIMM module : 16,32,64,128MB (SDRAM)
	100Pin SDRAM DIMM (Use only Samsung Memory Parts made specifically for this printer.)
	EEPROM(NVRAM) : 512byte
Emulation	PCL6 : Win9x/ME/NT4.0/2000/XP
	Postscript Level3 : MAC OS 8.6 ~ 9.2/10.1 ~ 10.3
	PCL5e : Various Linux OS including Red Hat, Caldera, Debian, Mandrake, Slackware, SuSE and Turbo Linux
Interface	Parallel : IEEE 1284 Bidirectional Parallel - Modes supported : Compatible,Nibble,Byte,ECP
	USB(without HUB mode) -USB 2.0 compliant -12 Mbps 1 port
	Network Interface : - 10/100 Base TX(option for ML-2550) - 802.11b Wireless LAN(option for ML-2550,ML-2551N)
Interface switching	Automatic
Interface time-out	5min(Max.)
Font	45 Scalable Font , 1 Bitmap Font ,Postscript 3 internal font 136

3.3 Electrical Specification

ITEM	DESCRIPTION		REMARK
Input Voltage	Nominal input voltage	220-240 VAC / 100~127VAC	
	Input voltage range	198-255 VAC/ 90~135VAC	
	Nominal frequency	50/60 MHz	
	Frequency tolerance	+3Hz	
Power Consumption	450W Avg or less (with SCF)		
	Idling : 100W Avg or less		
	Power Save : 15W Avg or less		

3.4 TONER Cartridge (Developer)

ITEM	DESCRIPTION	REMARK
Life span	Starter: Up to 5,000 pages	A4 Size, @ISO 5% Coverage, SIMPLEX
	Replacement : Up to 10,000 pages	
Developing	Non-magnetic Contact Developing	
Charging	Conductive Roller Charging	
Toner supply Method	Not possible, replace the whole toner cartridge.	
Toner checking sensor	Fitted	
Ozone	0.1PPM or less	
Style	Single cartridge	

3.5 Environmental Condition

ITEM	OPERATING	STORAGE
Temperature	10~30˚C(50-90˚F)	-20~40˚C (-4~104˚F)
Humidity	20~80%RH	10~80%RH

3.6 Paper Handling Specifications

>> Input Paper Size

PAPER	PAPER SIZE	1ST CASSETTE	2ND CASSETTE	MP TRAY	DUPLEX
A4	210 X 297 mm	O	O	O	O
Letter	216 X 279(8.5 X 11")	O	O	O	O
US Folio(Legal13")	216 X 330(8.5 X 13")	O	O	O	O
Legal(Legal14")	216 X 356(8.5 X14")	O	O	O	O
Executive	184 X 267((7.25 X10.5")	O		O	
Statement	140 X 216(5.5 x8.5")			O	
ISO B5	176 X 250	O		O	
JIS B5	182 X257	O		O	
A5	148 X 210	O		O	
A6	105 X148			O	
No.10 Env.	105 X 241(4.15 X 9.5")			O	
Monarch Env.	98 X191(3.87 X 7.5")			O	
DL Env.	110 X 220(4.33 X 8.66")			O	
C5 Env.	162 X 229(6.38 X 9.01")			O	
C6 Env.	114 X 162(4.49 X 6.38")			O	
Transparency(OHP)	A4 or Letter			O	
Label paper	A4 or Letter			O	

O : Supported

>> Input capacity

ITEM	DESCRIPTION	
Cassette	Paper	500 sheets
MP tray	Paper	100 sheets
	Transparencies	50 sheets
	Envelopes	10 sheets
	Labels	25 sheets
Option Cassette	500sheets	

>> Output capacity

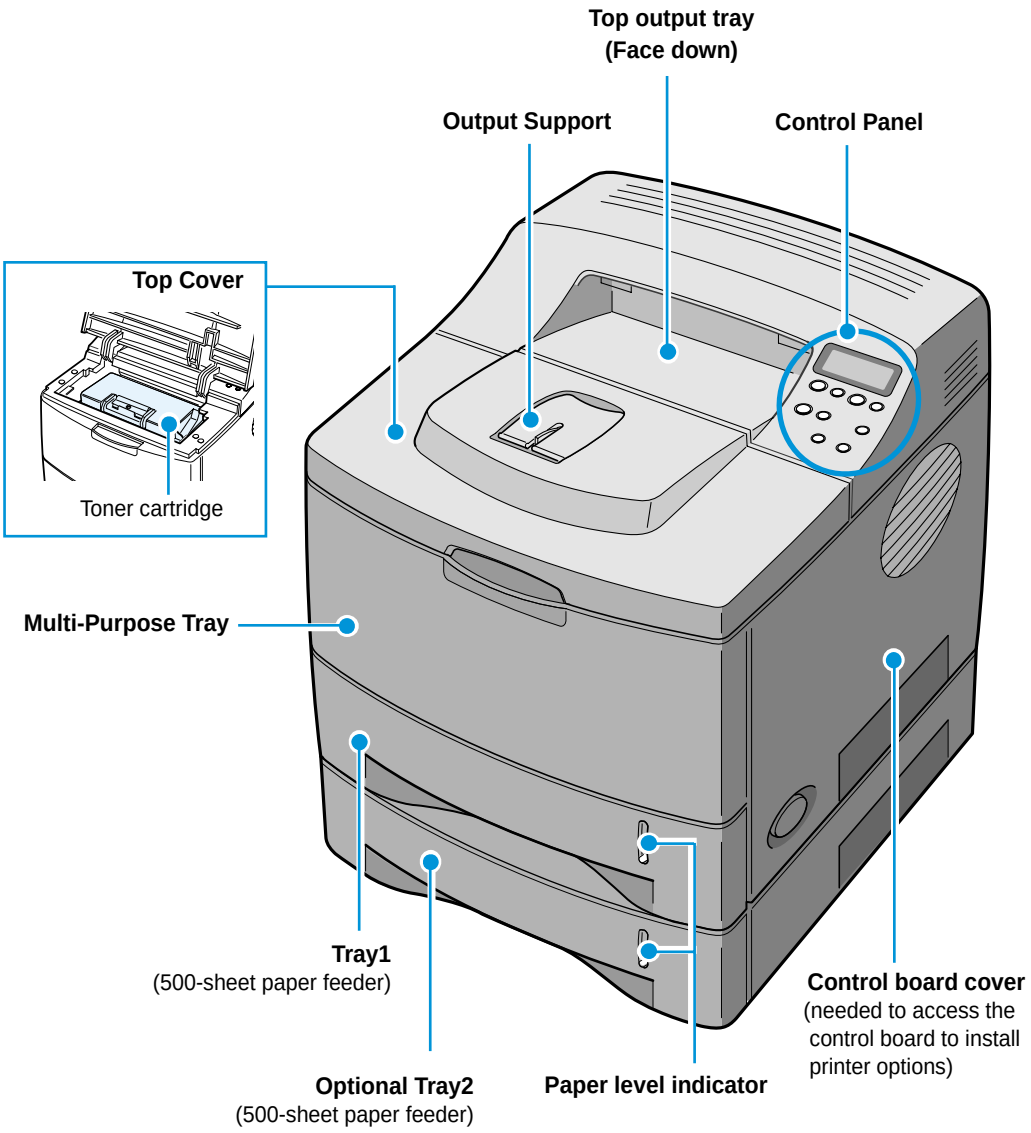
ITEM	DESCRIPTION
Face Down(Top) tray	250 sheets
Face UP(Rear) tray	100 sheets

4. Summary of Product

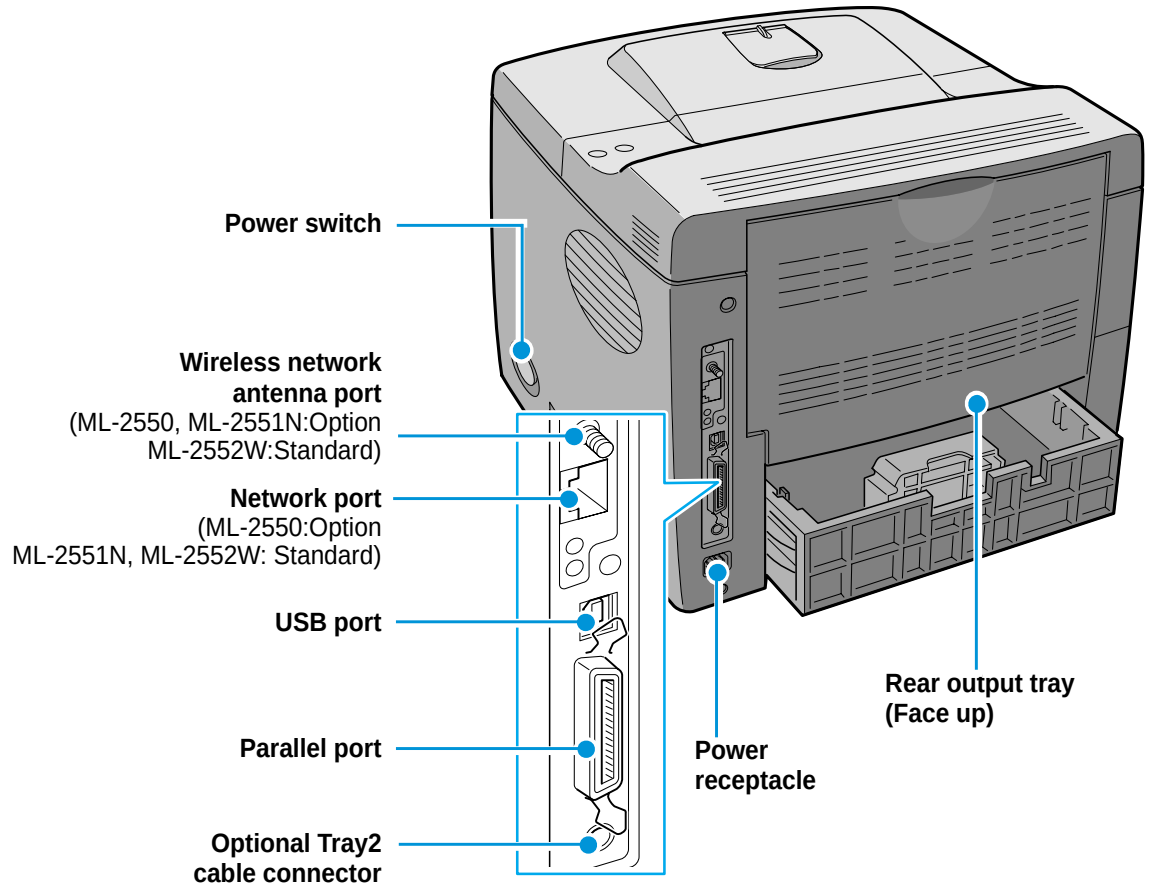
This chapter describes the functions and operating principal of the main component.

4.1 Printer Components

4.1.1 Front View

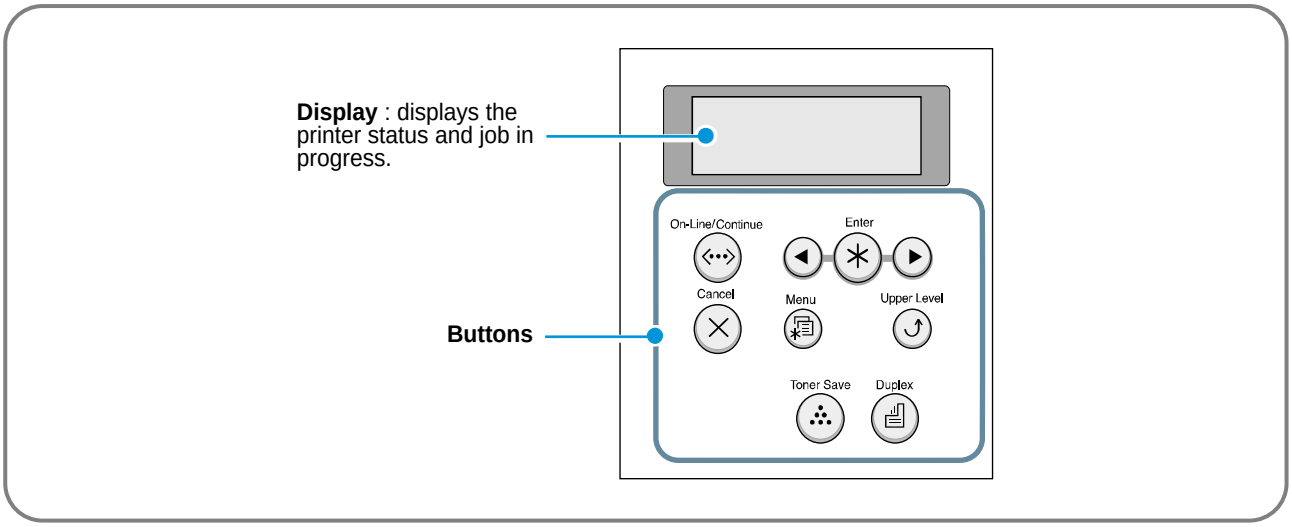


4.1.2 Rear View



4.1.3 Control Panel

The control panel on the top right side of your printer has the display and the nine buttons.



4.1.3.1 Display

Message	Description
Ready	• The printer is on-line and ready to print. • If you press **On-Line/Continue** ,the printer switches to off-line.
Offline	• The printer is off-line and cannot print. • If you press **On-Line/Continue** ,the printer switches to on-line.
Printing XXX * *xxx is the current emulation.*	• The printer is printing. • If you want to cancel printing,press **Cancel** .
Sleeping...	• The printer is in Power Save mode, consuming less power. When a print job is received from the computer or if any button is pressed,the printer switches to on-line.

4.1.3.2 Buttons

<table>
<tr><th>Button</th><th colspan="3">Description</th></tr>
<tr><td rowspan="5">On-Line/Continue
 </td><td colspan="3">• Press to switch between on-line and off-line.
• In menu mode,press to return to ready mode.
You can check the printer status according to the button backlight.</td></tr>
<tr><td rowspan="2">Green</td><td>On</td><td>The printer is on-line and can receive data from the computer.</td></tr>
<tr><td>Blinking</td><td>• When the backlight slowly blinks,the printer is receiving data from the computer.
• When the backlight fast blinks,the printer is receiving and printing data.
If you want to pause printing, switch the printer to off-line.</td></tr>
<tr><td rowspan="2">Orange</td><td>On</td><td>The printer stops printing due to a major error.Check the display message.</td></tr>
<tr><td>Blinking</td><td>A minor error occurs and the printer is waiting an error to be cleared.Check the display message.When the problem is cleared,the printer resumes printing.If you want to ignore this warning,press this button.</td></tr>
<tr><td>Off</td><td colspan="2">• The printer is off-line and cannot print.
• The printer is in Power Save mode.
When data is received,it switches to on-line.</td></tr>
<tr><td>Menu
 </td><td colspan="3">• Press to enter menu mode.
• In menu mode,press to scroll through the menus.</td></tr>
<tr><td>Enter
 </td><td colspan="3">In menu mode,press to select the displayed submenu item or confirm the changed setting. You can see the selected value marked with *.</td></tr>
<tr><td> </td><td colspan="3">In menu mode,press to scroll through submenu items or setting options. Pressing ▶ moves you to the next option and pressing ◀ sends you back to the previous option.</td></tr>
<tr><td>Cancel
 </td><td colspan="3">• Press to cancel the current print job.
• In menu mode,press to return to ready mode.</td></tr>
<tr><td>Upper Level
 </td><td colspan="3">In menu mode,press to go back to the upper menu level.</td></tr>
<tr><td>Toner Save
 </td><td colspan="3">Press to enable or disable Toner Save mode.
• If the button backlight is on,the mode is enabled and the printer uses less toner to print a document.
• If the button backlight is off,the mode is disabled and the printer will print in the normal quality.
For more information on the Toner Save mode.</td></tr>
<tr><td>Duplex
 </td><td colspan="3">Press to enable or disable the double-sided printing.
• If the button backlight is on,the printer print on both sides of paper with long edge binding.
• If the button backlight is off,the double-side printing is disabled and the printer prints on one side of paper.

Note : The double-sided printing setting in the printer driver overrides that of the control panel.</td></tr>
</table>

4.1.3.3 Using Control Panel Menus

A number of menus are available to make it easy for you to change printer settings.

Accessing Control Panel Menus

You can control your printer from the printer 's control panel. You can also set the control panel menus while the printer is in use.

1. Press the **Menu** button ( ) until you see the desired menu on the bottom line of the display or Press the scroll button (or) until the desired menu item displays on the bottom line.

2. Press the **Enter** button ( ) to access the menu.

3. Press the scroll button (or) until the desired menu item displays on the bottom line.

4. Press the **Enter** button ( ) to confirm the selected item.

5. If the selected menu item has submenus,repeat steps 3 and 4.

6. Press the scroll button (or) until the desired setting option displays on the bottom line or enter the required value.

7. Press the **Enter** button ( ) to save your input or selection.

An asterisk **(*)** appears next to the selection on the display, indicating that it is now the default.

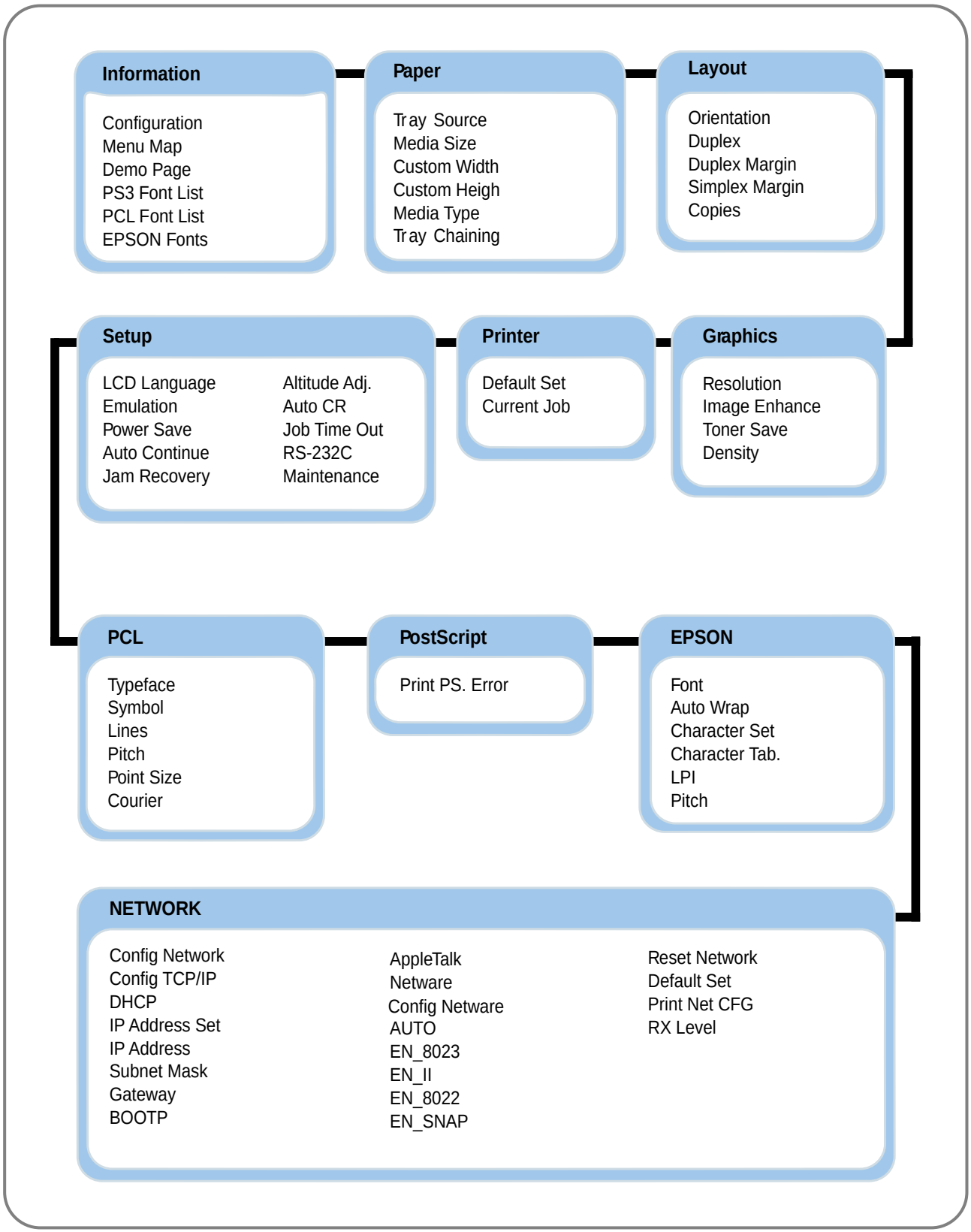
8. To exit the menu,press the **Upper Level** button ( ) repeatedly,or the **Cancel** button ( ) .

After 60 seconds of inactivity (no key has been pressed), the printer automatically returns to ready mode.

NOTE : Duplicate print settings that are selected in the printer driver override the settings on the control panel.

4.1.3.4 Overview of Control Panel Menus

The control panel menus are used to configure the printer for your environment.
The control panel provides access to the following menus.



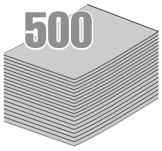
4.1.3.5 Special Features

Your new printer is equipped with special features that improve the print quality,giving you a competitive edge.
You can:

Print with excellent quality and high speed

- You can print at 1200 dots per inch (dpi).See page 5.25.
- Your printer prints 21 pages-per-minute (Letter size), 20 pages-per-minute (A4 size).

Handle paper flexibly



- A 100-sheet Multi-Purpose Tray supports letterheads, envelopes,labels,transparencies,custom-sized materials,postcards,and heavy paper.
- Standard 500-sheet input tray (Tray1)and optional 500-sheet input tray (Tray2)supports all standard sizes of paper.
- Two output tray;select either the top output (face-down)or the rear output tray (face-up)for the most convenient access.
- Straight-through paper path capability from the Multi-Purpose Tray to the rear output tray.

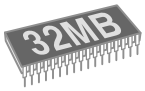
Create professional documents

- You can customize your documents using **Watermarks,** such as “Confidential.”
- Print **Booklets** .This feature enables you to easily print the pages required to create books.Once printed,all you have to do is to fold and staple the pages.
- Print **Posters** .The text and pictures of each page of your document are magnified and printed across the selected sheet of paper.After the document has printed,trim off the white edges of each sheet.Tape the sheets together to form a poster.

Save your time and money

- This printer allows you to use **Toner Save mode** to save toner.
- You can print on both sides of the paper to save paper (double-sided printing).
- You can print multiple pages on one single sheet of paper to save paper (N-Up printing).
- Preprinted forms and letterheads can be printed on plain paper.
- This printer automatically conserves electricity by substantially reducing power consumption when not printing.
- This printer meets Energy Star guidelines for energy efficiency.

Expand the printer capacity



• This printer has 32 MB of memory which can be expanded to **160 MB**.

• **Network interface** enables network printing.You can add the optional network interface card to ML-2550.

ML-2551N and ML-2552W comes with a built-in network interface,10/100 Base TX.ML-2552W also has a wireless network interface.

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* PostScript 3 Emulation
IPS-PRINT_Printer language Emulation © Copyright 1995-2003,Oak Technology,Inc.,All rights reserved

* 136 PS3 fonts
Contains UFST and MicroType from Agfa Monotype Corporation.

Print in various environments

• You can print in Windows 95/98/Me/NT 4.0/2000/XP .

• Your printer is compatible with Linux and Macintosh .

• Your printer comes with both the Parallel and USB interfaces.

You can also use a network interface .ML-2551N and

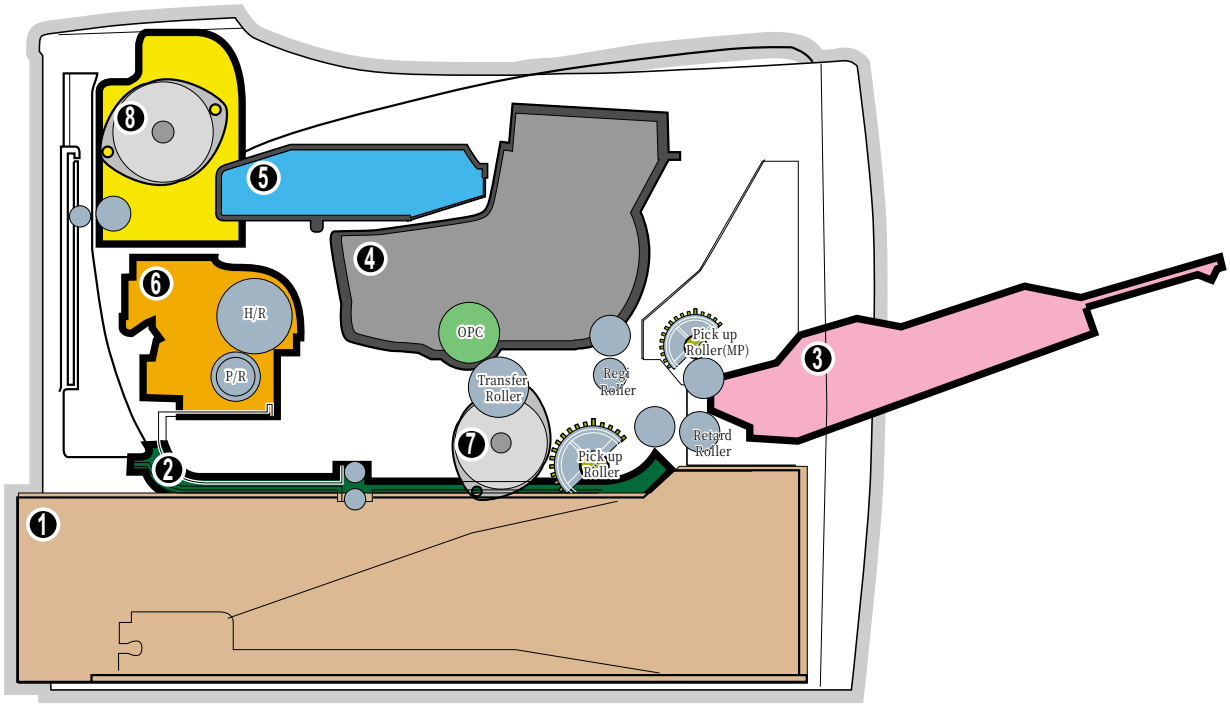
ML-2552W comes with a built-in **network interface**,10/100 Base TX.ML-2552W also has a wireless network interface. But, you need to add the optional network interface card to ML-2550.

Printer Features

The table below lists a general overview of features supported by your printer.

Features	ML-2550	ML-2551N	ML-2552W
IEEE 1284	STANDARD	STANDARD	STANDARD
USB 2.0	STANDARD	STANDARD	STANDARD
Network Interface	OPTION	STANDARD	STANDARD
Wireless LAN	OPTION	OPTION	STANDARD
PostScript Emulation	STANDARD	STANDARD	STANDARD

4.2 System Layout



1. Cassette
2. Duplex Unit
3. MPF
4. Toner Cartridge
5. LSU
6. Fuser
7. Main Motor
8. Exit Motor

4.2.1 Feeding

It is consists of a basic cassette, an MP tray for supplying different types of media : envelope, label special paper, duplex unit, and parts related to paper transferring.

1) Separation method

Separate it from the finger mounted to the cassette side guide and apply retard roller that uses a spring clutch. A feed roller uses an electronic clutch to control driving power.

2) Basic cassette

It takes a center loading method and applies 'both side finger separating method.' It means that there is a paper sensor, but a paper size is detected after detecting the first paper by software.
Both the side guide and the rear guide can be adjusted for for various types of papers from A5 to legal size paper.
It has a paper existence sensing function (Capacity: 500 sheets of general paper), paper arranging function, various size papers accepting function, SCF paper path function, and displaying function of paper remaining amount.
In the front side, there is a paper level indicator.

3) Pick-up roller

It has functions such as a paper pickup function, driving control function, paper feeding function, and removing electronic static function.

4) Retard roller

It takes an arrangement method which uses a stopper roller and a weight without electric actuator.It has paper separating function, driving control function, and multi feeding prevention function.

6) Registration roller

It has a paper arranging function, paper transferring function, paper detecting function, jam removing function, and so on.

7) MP tray

It has a paper arranging function, paper transferring function, jam removing function, and so on.
It uses rubbing pad method to feed 100 sheets of general papers and 100 envelops.
It is possible to extend to 300mm for accepting a legal size paper.

8) Duplex unit

It has paper transferring function, paper guide function, jam removing function, paper sensing function, and main board supporting function.
It is designed for basic attachment, and the duplex feeding takes a side feeding method. Usable papers are A4, letter, and legal size paper.
For removing a jam occurred in a front part, it is designed to open a cassette and a guide. It is designed to open a rear cover to remove a jam in a rear part.
If a face up tray is open, the duplex option cannot be used.

9) SCF (Second Cassette Feeder)

It is the same method with the main cassette, and the capacity is 500 sheets.
It has a separate driving mechanism and feeds only A4, letter, and legal size paper.
It is designed for a common use with a main cassette, but it cannot be attached with the main cassette.

4.2.2 Transfer

It consists of a PTL (Pre-transfer Lamp) and a transfer roller. A PTL sheds light on an OPC drum, lowers an electric potential of an OPC drum's surface, and improves the efficiency of the transfer.
A transfer roller transfers toner on an OPC drum to the paper.
Life span: Print over 100,000 sheets (In 15~30(C)

4.2.3 Driver Ass'y

By driving the motor, the system takes power. It is consisted of a main motor for feeding and a toner cartridge, and sub-motors for fuser and duplex reverse turn.

4.2.4 Fuser

It is consisted of a heat lamp, heat roller, pressure roller, thermistor and thermostat. It sticks the toner on a paper by heat and pressure to complete the printing job.

1) Thermostat

When a heat lamp is overheated, a Thermostat cuts off the main power to prevent over-heating.

3) Heat roller

The heat roller transfers the heat from the heat lamp to apply a heat on the paper. The surface of a heat roller is coated with Teflon, so toner does not stick to the surface.

4) Pressure roller

A pressure roller mounted under a heat roller is made of a silicon resin, and the surface also is coated with Teflon. When a paper passes between a heat roller and a pressure roller, toner adheres to the surface of a paper permanently.

5) Items for safety

Protecting device for overheating

- 1st protection device: Hardware cuts off when overheated
- 2nd protection device: Software cuts off when overheated
- 3rd protection device: Thermostat cuts off main power.

Safety device

- A fuser power is cut off when a front cover is opened
- Maintain a temperature of fuser cover's surface under 80(C for user, and attach a caution label at where customer can see easily when customer open a rear cover.

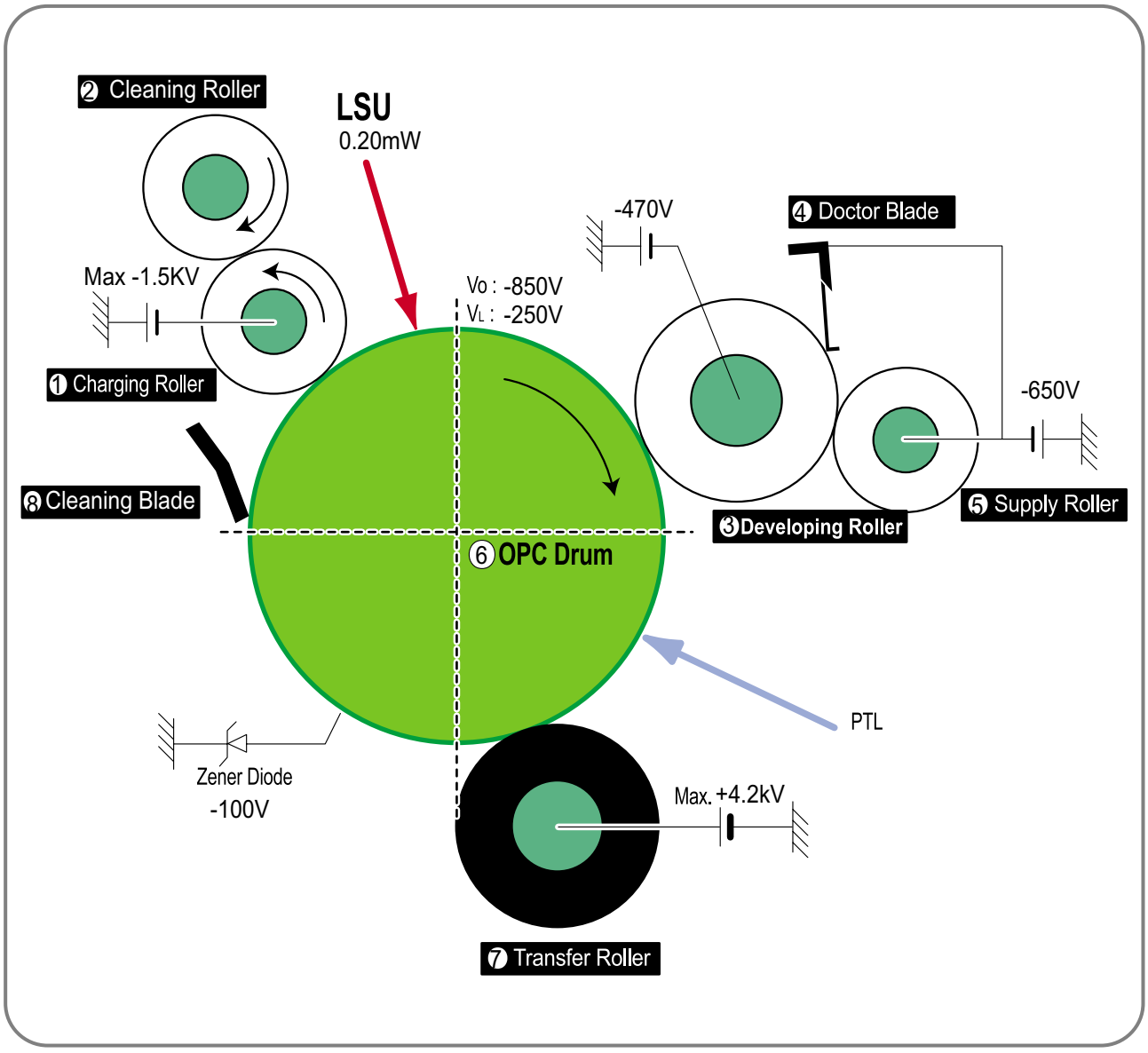
4.2.5 LSU (Laser Scanner Unit)

It is the core part of the LBP which switches from the video data received to the controller to the electrostatic latent image on the OPC drum by controlling laser beam, exposing OPC drum, and turning principle of polygon mirror. The OPC drum is turned with the paper feeding speed. The /HSYNC signal is created when the laser beam from LSU reaches the end of the polygon mirror, and the signal is sent to the controller. The controller detects the /HSYNC signal to adjust the vertical line of the image on paper. In other words, after the /HSYNC signal is detected, the image data is sent to the LSU to adjust the left margin on paper. The one side of the polygon mirror is one line for scanning.

4.2.6 Toner Cartridge

By using the electronic photo process, it creates a visual image. In the toner cartridge, the OPC unit and the toner cartridge unit are in a body. The OPC unit has OPC drum and charging roller, and the toner cartridge unit has toner, supply roller, developing roller, and blade (Doctor blade)

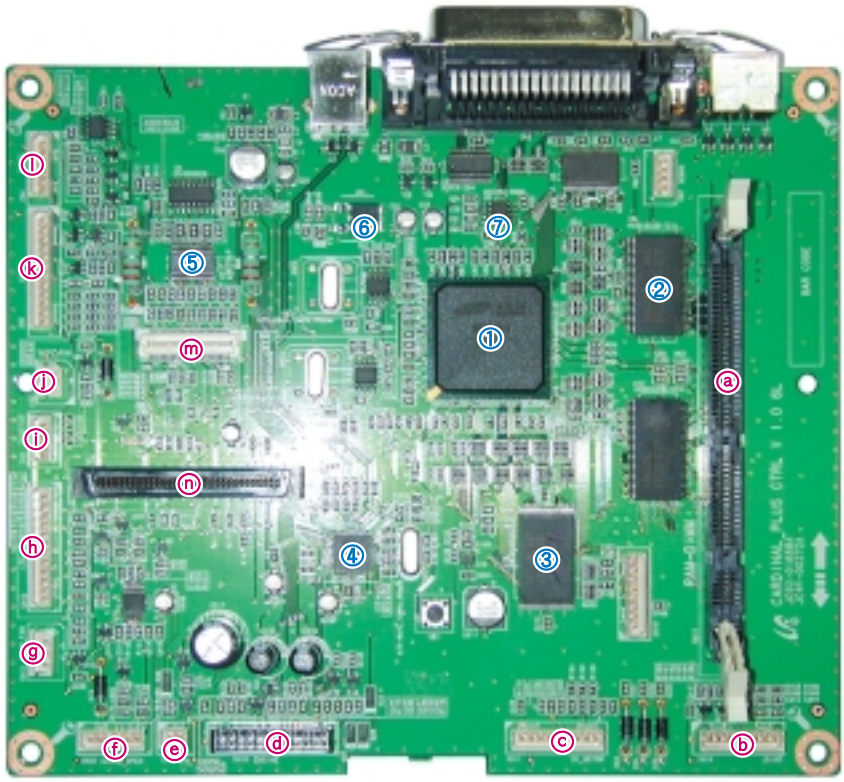
- Developing Method: Non magnetic 1 element contacting method
- Toner: Non magnetic 1 element shatter type toner
- The life span of toner: 10,000 sheets (LSA Pattern/A4 standard)
- Toner remaining amount detecting sensor: Yes
- OPC Cleaning: Cleaning blade type
- Management of disusable toner: Collect the toner by using Cleaning Blade
- OPC Drum protecting Shutter: Yes
- Classifying device for toner cartridge: ID is classified by interruption of the frame channel.



<Toner Cartridge Layout>

4.3 Main Board

Main controller part is organized with Asic (SPGPi) part, Memory part, and Engine interface part, and it is functions as a Bus control, I/O handling, Drivers, and PC interface by CPU.
Memory access has program memory (supports 32bit operation) and working memory (supports 32bit operation).



① SPGPv3
- It is a main CPU and an Asic of ARM1020 core which has a CPU core CLK with over 300MHz and a System bus with 100MHz.
  It uses 3.3V for operation voltage and I/O,It uses 80MHz for system bus CLK.

② SDRAM
- Main memory.SDCLK is 80MHz.

③ NAND Flash ROM
- Program Memory

④ ISP1582 – USB-IC
- It uses USB2.0 peripheral controller and 12MHz USB Clock.

⑤ A3977
- It is an exit motor driver IC and controls the motion of exit motor.

⑥ Regulator
- It supplies the core voltage to CPU by converting 3.3V to 1.3V.

⑦ EEPROM (24C04)
- It is an EEPROM with 12C method,and it is used to DIMM and Option.

ⓐ RAM--DIMM
- When extending a RAM,connect the additional SDRAM B' d.

ⓑ Joint B' d Connector
- By connecting to Joint B' d,it sends the operating signals of main/MP/Regi clutch and receives a cassette detect signal and a MP empty signal.
  If it is disconnected,it cannot detect such clutch operation and sensor.

ⓒ Motor Connector
- It is connected to a main BLDC motor,and it sends the motor control signal of CPU.
  If it is disconnected,a main motor does not operate.

ⓓ Engine Connector
- It connects a SMPS,supplies the power,and delivers the high voltage control signal,etc.
  If a harness is not normally connected to this connector,power cannot be supplied.

ⓔ PTL connector
- It connects to a PTL and helps to deliver the PTL On signal.

ⓕ Cover Open connector
- It detects the cover open.If it is disconnected,it cannot sense the cover on/off signal.

ⓖ Main Fan connector
- It drives a fan by connecting a main fan of a set.

ⓗ LSU connector
- It connects a LSU.

ⓘ DC Motor connector
- It connects an exit motor and drives a DC motor.

ⓙ SMPS Fan connector
- It connects a SMPS Fan.

ⓚ Cart B 'd connector
- It connects a toner cartridge and detects the cartridge information,the paper empty signal,and the paper regi signal.
  It connects the detecting signal of paper size,out-bin full,and thermistor.
  It could cause a fuser detecting error,a toner detecting error,and a paper detecting error when it is disconnected.

Ⓛ Panel connector
- It is connected to a LCD panel.

ⓜ Embedded Network Card connector
- A place to connect the Embedded MAC Network card.

ⓝ Shared Network Card connector
- A place to connect the shared Network card.

4.3.1 Controller

>> Video controller specification

The video controller board is located on the right side of the printer.
Basic Memory is 32 Mbytes SDRAM. Optional memory DIMMs are easily installed by following the simple instructions included in each option kit. Field upgradeable FLASH ROM firmware for controller
A.1 RAM DIMMs:Option SDRAM DIMM(Up to 128 Mbytes).

1) Printing Resolution

Native 600 x 600 dpi standard (PostScript 3,PCL6,PCL5e)
Available 300 x 300 dpi (PostScript 3,PCL6,PCL5e)
Resolution enhanced 1200 x 1200 dpi (PCL6,PostScript 3)
Gray level:128 scale for 600 dpi,and 200 scale for 1200 dpi;PostScript 3,PCL6
Toner Saver Mode
In Toner Saver Mode,the toner savings is 50 %with acceptable print quality.

2) Micro Controller

266MHz – 32 bit RISC Processor

3) Video Interface Controller

SPGPv3 Compatible Interface

4) Printer Language Emulations

PCL6 and PCL5e emulation with 45 scalable fonts from Bitstream,and 1 PCL bit-map
PostScript 3 emulation with 136 PS3 fonts from AGFA.
Font Download Utility
Support for DOS printing.
Support for double byte printing (including Simplified and Traditional Chinese characters)
Support for European currency symbol in PCL5e,PCL6 and PostScript Level 3
(Detailed information on emulations is contained in the Eureka Controller Spec)

5) Memory

The controller has 32 MB SDRAM and 32 MB NAND flash ROM on Board.
1 DIMM expansion slots for SDRAM DIMM
Package:DIMM;100-pin
Type:SDRAM
DIMM Type:Unbuffered (SEC Custom,support other products within SEC)
Error Checking:Non-parity
Speed:100/133 MHz
Voltage:3.3v
Samsung proprietary design
16/32/64/128MB

6) Interfaces

The system supports the following standard interfaces:

- •One parallel port
  - (IEEE 1284 –1994 compliant,Bi-directional,ECP/Nibble/Byte Mode).
- •One USB port
  - USB v.2.0 compliant
- •One 10/100 BaseT NIC connector
  - The printer supports an internal Network Interface Card (NIC),which can be installed pre-configured at the factory or as a customer installable option in thefield. This NIC supports all of the major Network Operating Systems such as the Novell NetWare, TCP/IP, etc. Details of the network specification will beprovided separately.

7) Control Panel

Refer to the additional specification document
This specification should address the hardware related to the front panel and buttons.
The menu structure of the graphical UI will be addressed in the Controller Spec.

4.3.2 Memory part

>> Flash Memory

It stores the System Program.

- Capacity: 2M Byte * 2
- Access Time : 70 nsec

>>SDRAM

It is used as Swath buffer, System working memory area, etc. when printing.

- Capacity: 32M Byte (Basic), upto 160M Byte (Option)
- DIMM : 16MB / 32MB / 64MB /128MB
- Type : SDRAM 100MHz/133MHz , 16bit

>>ROM DIMM

It supports the option ROM DIMM 1 Slot for supporting the expanding Memory.

- Capacity : 8MByte (Max)
- Access Time : 70nsec

4.3.3 RESET Circuit

After printer power is ON and 50~200 ms are passed, the reset signal from RESET IC (XC61FN3112MR) resets various IC such as the CPU, Memory, etc. to prevent malfunction of the set by setting the initial value of port.

4.3.4 ClOCK Circuit

Basically, it consists of the Crystal (12.5MHz) and Capacitor (27pF) which is connected to the crystal in parallel, and it is inputted to the MCLLK_Signal via the CY25814. The purpose of the adding SY25814 is substitution of EMI.

4.3.5 INTERFACE Part

>>IEEE1284

It supports the IEEE 1284 B Type Connection, and the protocol supports the IPP, ECP, Compatibility, Byte, and Nibble mode.

>>USB2.0

USB2.0 Compliant, 480Mbps 1 port

>>Network

- Option : Ethernet 10/100 Base TX
- Protocol : SPX/IPX, TCP/IP,Appletalk, SNMP, HTTP 1.1, DLC/LLC

>>Panel

- LCD : 16Char. * 2 Line / Back-light(Yellow)
- Key : 9 Key
- LED : 3 LED

The UART method is used for the controller and panel interface, and the HR 48C50 Holtak Micom is used

4.3.6 Sensor input circuit

4.3.6.1 Paper Empty Sensing

The Paper empty sensor (Photo Interrupter) on the engine board informs the state of paper to LPEC1 whether it is empty or not by operation of the actuator.
When cassette is empty, it detects the fact by reading the GPIO3_1 of LPEC1, and then displays the fact on the LCD panel.

4.3.6.2 MP Sensing

By operation of the MP Sensor (Photo Interrupter) on frame and Actuator, it informs the state of paper to CPU whether it is empty or not. It reads the IP5 sec_DRAM(K26) of CPU for recognizing paper in MP, and paper is fed from MP if there is.

4.3.6.3 Paper Feeding

When paper passes the actuator on the feed sensor part, it detects the signal of Photo interrupter, informs the paper feeding state to CPU, and then sprays the image data after certain time.
If it doesn't detect the feed sensor within 1 sec. after paper is fed, paper jam0 (LPEC1 GPIO3_2) is occurred. (Displays on the LCD panel)

4.3.6.4 Toner Remain Sensing

The Toner cartridge terminal is mounted to the joint board located on frame. When the toner cartridge is inserted, it is adhered to the contacting point of the joint board to sense whether the toner cartridge exists or not, ID, amount of toner, and so on.

4.3.6.5 Paper Exit Sensing

It detects paper state whether paper gets out from the set with operation of exit sensor on the engine board and actuator on the frame. Paper detects the on/off time of exit sensor by reading LPEC1 GPIO3_6, and the normal operation or jam information is informed to the CPU.
The paper JAM2 is informed. (Displays the state on LCD panel)

4.3.6.6 Cover Open Sensing

The Cover open sensor is located on the front cover. After the front cover is opened, +24V and +5V (DC fan, solenoid, main motor, polygon motor part of LSU, HVPS, LSU Laser diode), which is supplied to each unit, is cut off.

4.3.6.7 DC FAN/Solenoid Driving Circuit

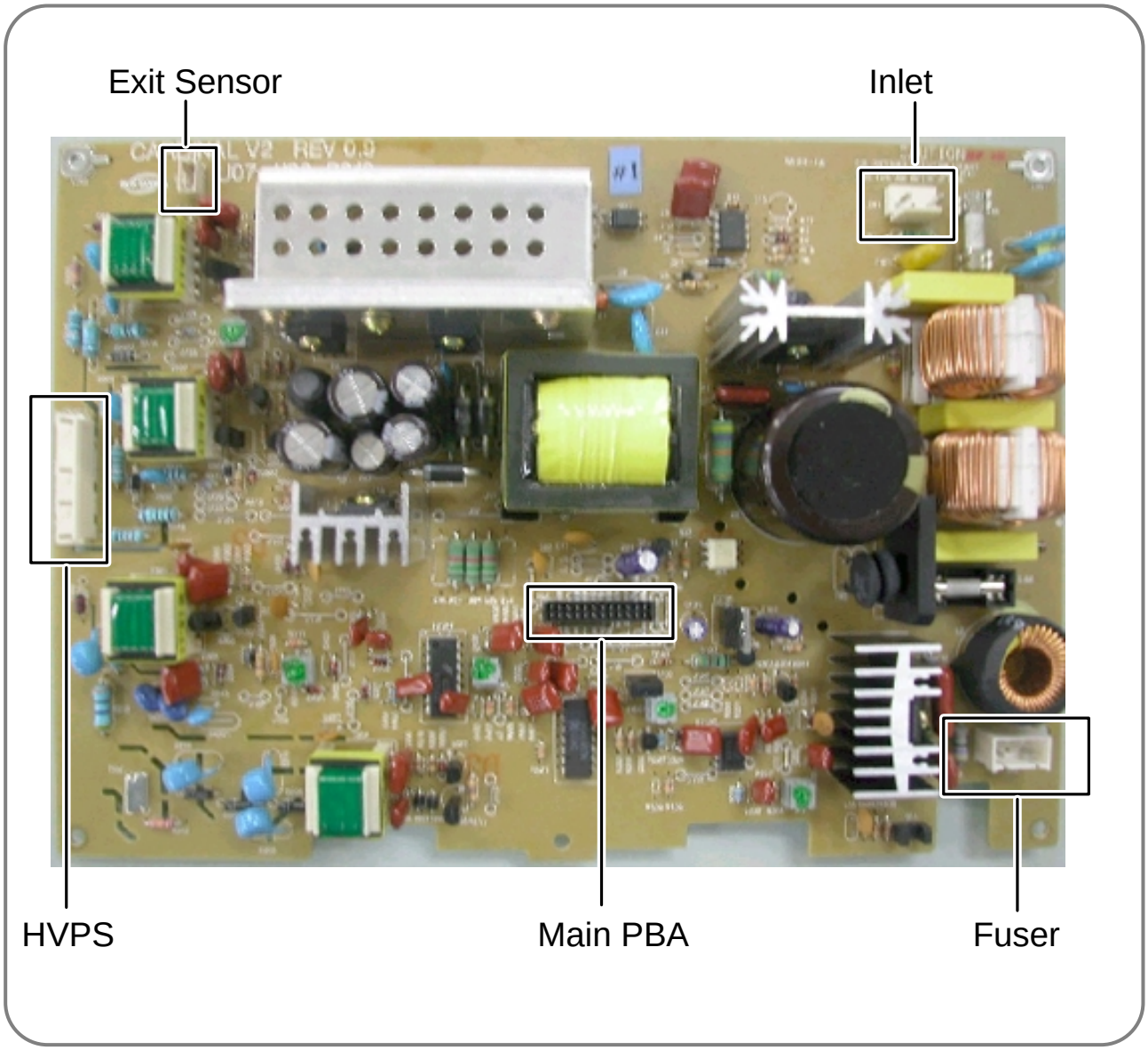
A fan driving circuit is driven by a transistor and a controller which is in the LPEC.
It is automatically turned off when a machine turns to sleep mode.
There are two solenoids, and it is driven by an MP signal and a paper pick-up signal.

4.3.6.8 Motor Driving Circuit

A main motor (BLDC) drives a feeding and developing unit and an exit motor (Step) drives a Fuser and an Exit ass'y.
When printing with a duplex function, it rotates the Exit Motor to a normal/reverse direction. It controls by dividing the acceleration section, standard speed section, and reducing speed section. A BLDC Motor is operated by a clock and enable signal, and a Step Motor is managed with an A3977 driver IC.

4.4 SMPS & HVPS board

The SMPS and HVPS are in one united board. The SMPS part supplies the DC power to the system.
It takes either 110V or 220V and outputs the +3.3V and +24V to supply the power to the main board.
The HVPS part creates the high voltage of THV/MHV/Supply/Dev and supplies it to the toner cartridge part for making the best condition to display the image.
The HVPS part takes the 24V and outputs the high voltage for THV/MHV/BIAS, and the outputted high voltage is supplied to the toner, OPC cartridge, and transfer roller.



4.4.1 HVPS(High Voltage Power Supply)

1) Transfer high voltage (THV (+))

- Function: It is a voltage that transfers toner on an OPC Drum to paper.
- Output voltage: MAX +4.2 KV +/- 5% (Duty is changeable, Not loading)
- 1.7KV +/- 15% (When cleaning, 200MOhm - It transfers toners with (+) polarity of transfer roller to an OPC Drum.
- Error type: IF THV (+) is not outputted, it causes a low density due to toner on an OPC Drum if it is not transferred to paper. It is possible that over-flow occurs if toner is piled up in a toner vessel continuously.

2) Charge voltage (MHV)

- Function: It is a voltage that charges a surface of OPC to -750V~-900V.
- Output voltage: -1.35KV~1.5KV DC +/- 50V
- Error type: IF MHV is not outputted, toner overflows and reaches to an OPC drum if surface of an OPC is not charged. A black paper is printed out when it happens.

3) Cleaning voltage: THV (-)

- Function: It removes contamination at a rear by sending (-) polarity in a transfer roller to OPC drum to take toner.
- Output voltage: A change range is large according to a load because there is no feedback control =(-600V~-1200V)
- Error type: An error due to contamination of toner on a backside of printing paper.

4) Developing voltage (DEV)

- Function: It is a voltage that develops toner with electronic potential difference of the section exposed by LSU (Laser Scanning Unit).
  * When printing, exposing voltage of OPC is -250V and exposing voltage of DEV is -470V. Therefore, toner with (-) polarity is developed on an exposed section.
- Output voltage: -380V~500DC +/- 20V
- Error type: a) If DEV is GND, a density gets extremely low.
  b) When DEV is floating due to instable of terminal's contacting point, and etc., density gets extremely high.

5) Supplying voltage (SUP)

- Function: It is a voltage that supplies toner to a developing roller.
- Output voltage: -560V~680V DC +/- 50V (Use AENER, Gearing of DEV - (-)180V more than DEV)
- Error type: a) When SUP is GND, density gets extremely low.
  b) If SUP is floating due to instable of terminal's contacting point, and etc., density gets extremely low that it is hard to catch up with eyes.

6) OPC Ground ZENER voltage

- Function: It is a voltage to prevent an image contamination under the condition of low temperature and low humidity environment.
- When a set prints without an output voltage, -100V is maintained on OPC ground. (-100V ZENER diode is connected to OPC ground)
- Error type: a) When ZENER diode is - 0V, there is no serious image problem in general environment, but in low temperature and low humidity environment, it is possible that a contamination occur on entire image
  b) When ZENER diode is disconnected, a blank page is printed out. (It is the same case as when a ZENER diode is disconnected to OPC ground.)

4.4.2 SMPS(Switching Mode Power Supply)

It is the power source for the whole system. It is an independent module so it is possible to use for common use. It is mounted at the bottom of the set.
It consists of the SMPS part, which supplies the DC power for driving the system, and the AC heater control part, which supplies the power for fuser. SMPS has three outputting channels (3.3V, 5V and +24V).
There are three kinds of power, 120V exclusive (America), 220V exclusive (Europe), and 220V for china (nations with instable power supply).

>>AC Input

- Inputting rated voltage : AC 220V ~ 240V AC 100V ~ AC 127V
- Inputting voltage fluctuating range: AC 198V ~ 255V AC 90V ~ 135V
- Rated frequency : 50/60 Hz
- Frequency fluctuating range : 47 ~ 63 Hz
- Inputting voltage: Under 5.5Arms/2.5Arms

>>Rated Power Output

NO	Item	CH1	CH2	CH3	Remark
1	Channel name	+3.3V	+5V	+24.0V	
2	CONNECTOR PIN	CON 3 3.3V PIN: 12, 14 GND PIN: 16, 18	CON 3 5V PIN : 8 GND PIN: 7	CON 3 24V PIN: 2, 4, 6 GND : 7, 8, 10	
3	Rated outputting voltage	3.3V ± 5% (3.2 ~ 3.4V)	+5V ± 5% (4.75 ~ 5.25V)	+24V ± 5%, -5% (21.6 ~ 26.4V)	
4	Maximum outputting voltage	1.5 A	0.5 A	0.5 A	
5	Peak loading voltage	1.5 A	0.5 A	0.5 A	1ms
6	Ripple noise voltage	200mVp-p	100mVp-p	500mVp-p	
7	Maximum output	5 W	2.5 W	84 W	
8	Peak output	5 W	2.5 W	84 W	1ms

>>Consumption Power

NO	Item	CH1 (+3.3V)	CH2 (+5V)	CH3 (+24V)	System
1	Stand-By	0.6 A	0.25A	0.4 A	AVG : 100 Wh
2	PRINTING	1.0 A	0.25 A	2.0 A	AVG : 450 Wh
3	Sleep-Mode	0.4 A	0.01 A	0.4 A	AVG : 20 Wh

>>Length of Power Cord: 1830 ± 50mm

>>Power Switch : Use

>>Feature
• Insulating resistance : over 50MΩ(at DC 500V)
• Insulating revisiting pressure Must be no problem within 1min. (at 1500Vzc, 10mA)
• Leaking voltage : under 3.5mA
• Running voltage : under 50A peak (at 25°C, Cold start)
Under 60A peak (in other conditions)
• Rising Time : Within 2sec
• Falling Time : over 20ms
• Surge: Ring Wave 6KV-500A (Normal, Common)

>>Environment Condition
• Operating temperature range : 0°C~50°C
• Maintaining temperature range : -25°C~85°C
• Maintaining humid range : 10% ~90% RH
• Operating atmospheric pressure range: 1

>>EMI Requirement
CISPR ,FCC, CE, MIC, C-Tick,

>>Safety Requirement
IEC950 UL1950, CSA950, C-UL, TUV, Semko, iK, CB, CCC(CCIB),GOST, EPA

4.4.3 Fuser AC Power Control

Fuser (HEAT LAMP) gets heat by using AC power. The AC power controls the switch with the Triac, a semiconductor switch. The 'On/Off control' is operated when the gate of the Triac is turned on/off by Photo triac, which is insulting part.
In the other words, the AC control part is passive circuit, so it turns the heater on/off with taking signal from engine control part. When the 'HEATER ON' signal is turned on at engine, the LED of PC1 (Photo Triac) takes the voltage and flashes. From the flashing light, the Triac part (light receiving part) takes the voltage, and the voltage is supplied to the gate of Triac and flows into the Triac. As a result, the AC current flows in the heat lamp, and heat is occurred.
On the other hand, when the signal is off, the PC1 is off, the voltage is cut off at the gate of Triac, the Triac becomes off, and then the heat lamp is turned off.

>>Triac (THY1) feature:12A,600V SWITCHING

>>Phototriac Coupler (PC3)
• Turn On If Current : 16mA
• High Repetive Peak Off State Voltage : Min 600V

4.5 Engine F/W

4.5.1 Feeding

If feeding from a cassette, the drive of the pickup roller is controlled by controlling the solenoid. The on/off of the solenoid is controlled by controlling the general output port or the external output port. If feeding from a manual feeder, decide to insert the paper according to the operation of the manual sensor, and by driving the main motor, insert the paper in front of the feed sensor. While paper moves, occurrence of jam is judged as below. (Refer to the [6.2 Paper Transfer rout])

4.5.1.1 Jam 0

- After picking up, paper cannot entered due to paper mis-feed.
- After picking up, paper entered but it cannot reach to the feed sensor in certain time due to slip, etc.
- After picking up, if the feed sensor is not on, repack up. After repacking up, if the feed sensor is not on after certain time, it is Jam 0.
  - It is a status that the leading edge of the paper doesn't pass the feed sensor.
- Even though the paper reaches to the feed sensor, the feed sensor doesn't turn on.
  - It is a status that the leading edge of the paper already passed the feed sensor.

4.5.1.2 Jam 1

- After the leading edge of the paper passes the feed sensor, the tailing edge of the paper cannot pass the feed sensor after certain time. (The feed sensor cannot be Off)
- After the leading edge of the paper passes the feed sensor, the paper cannot reach the exit sensor after certain time. (The exit sensor cannot be On)
  - The paper exists between the feed sensor and the exit sensor.

4.5.1.3 Jam 2

- After the tailing edge of the paper passes the feed sensor, the paper cannot pass the exit sensor after certain time.

4.5.1.4 Duplex Jam 1

A leading edge of a paper didn't reach a Duplex Sensor after certain time passes.

4.5.1.5 Duplex Jam 2

After a leading edge of the paper passes the Duplex Sensor, the rear edge of the paper does not pass a Duplex Sensor within a certain time.

4.5.2 Drive

A main motor (BLDC) drives a feeding and developing unit and an exit motor (Step) drives a Fuser and an Exit ass'y.
When printing with a duplex function, it rotates the Exit Motor to a normal/reverse direction. It controls by dividing the acceleration section, standard speed section, and reducing speed section. A BLDC Motor is operated by a clock and enable signal, and a Step Motor is managed with an A3977 driver IC.

4.5.3 Transfer

The charging voltage, developing voltage and the transfer voltage are controller by PWM (Pulse Width Modulation). The each output voltage is changeable due to the PWM duty. The transfer voltage admitted when the paper passes the transfer roller is decided by environment recognition. The resistance value of the transfer roller is changed due to the surrounding environment or the environment of the set, and the voltage value, which changes due to the environments, is changed through AD converter. The voltage value for impressing to the transfer roller is decided by the changed value.

4.5.4 Fusing

The temperature change of the heat roller's surface is changed to the resistance value through the thermistor. By converting the voltage value, which impressed to the resistance, to the digital value through the AD converter, the temperature is decided. The AC power is controlled by comparing the target temperature to the value from the thermistor. If the value from the thermistor is out of the controlling range while controlling the fusing, the error stated in the table occurs. (For the domestic model, the Q-PID method has been applied.)

Error	Description	LCD Display
Open Heat Error	When warming up, it has been lower than 68°C over 28 seconds	Engine Fuser Error
Lower Heat Error	• Standby: It has been lower than 130°C over 10 seconds • Printing: - 3 consecutive page; it has been 20°C lower than the fixed fusing temperature over 7 seconds.	Engine Fuser Low Heat Error
Over Heat Error	It have been higher than 230°C over 10 seconds	Engine Fuser Over Heat Error

4.5.5 LSU

The LSU is consisted of the LD (Laser Diode) and the polygon motor control. When the printing signal occurs, it turns the LD and drives the polygon motor. When the receiving light part detects the beam, Hsync occurs. When the polygon motor speed becomes a normal, LReady occurs. If two conditions are satisfied, the status bit of the LSU controller register becomes 1 to be judged that the LSU is ready. If two conditions are not satisfied, the error shown in below occurs.

Error	Description	LCD
Polygon motor error	When the polygon motor's speed doesn't become a normal	Engine LSUError
Hsync error	The polygon motor's speed is normal, but the Hsync signal is not created.	HSYNC Error

5. Disassembly and Reassembly

5.1 General Precautions on Disassembly

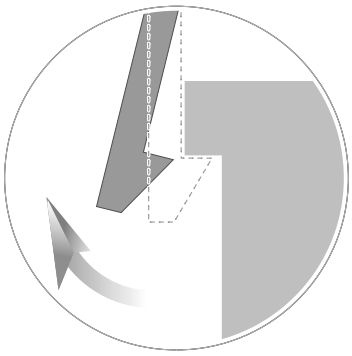
When you disassemble and reassemble components, you must use extreme caution. The close proximity of cables to moving parts makes proper routing a must.
If components are removed, any cables disturbed by the procedure must be restored as close as possible to their original positions. Before removing any component from the machine, note the cable routing that will be affected.

Whenever servicing the machine, you must perform as follows:

1. Check to verify that documents are not stored in memory.
2. Be sure to remove the toner cartridge before you disassemble parts.
3. Unplug the power cord.
4. Use a flat and clean surface.
5. Replace only with authorized components.
6. Do not force plastic-material components.
7. Make sure all components are in their proper position.

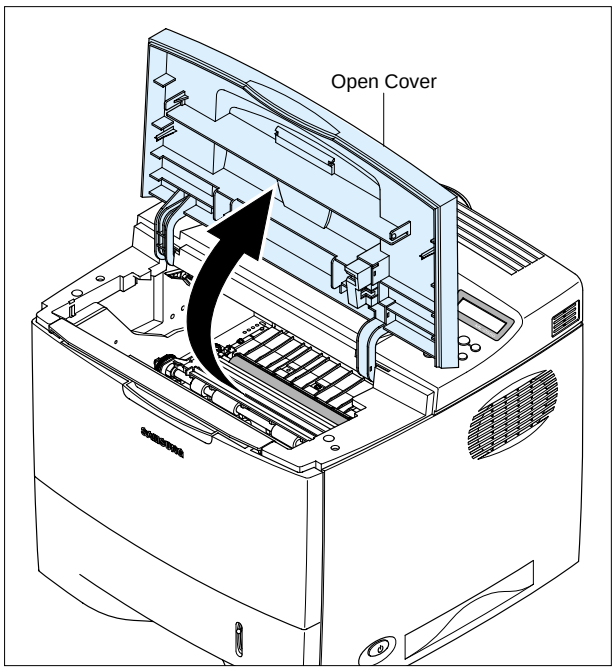
Releasing Plastic Latches

Many of the parts are held in place with plastic latches. The latches break easily; release them carefully.
To remove such parts, press the hook end of the latch away from the part to which it is latched.

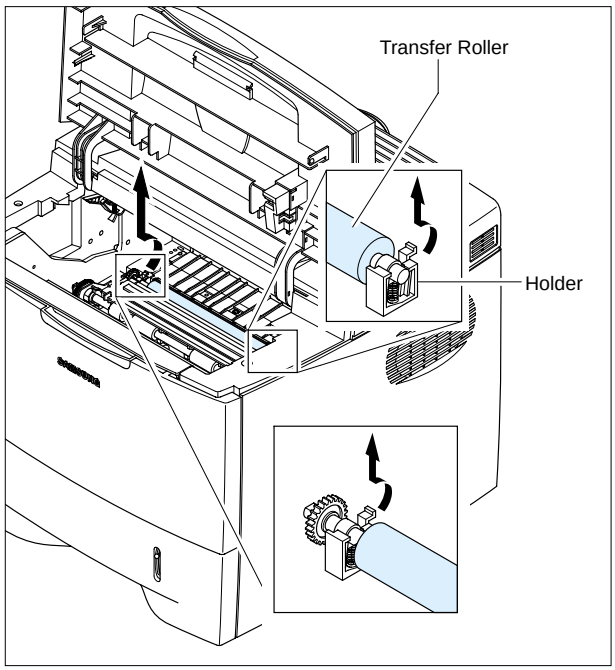


5.2 Transfer Roller

1. Open the Open Cover.

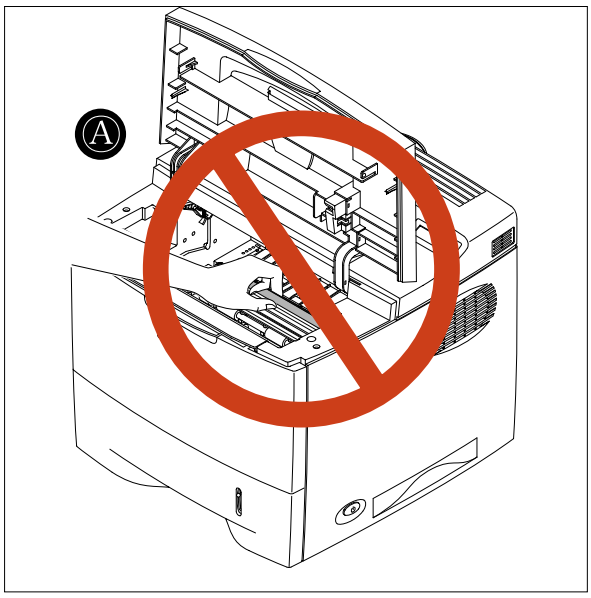


2. Hold the lever at both ends of the roller, then remove the roller.

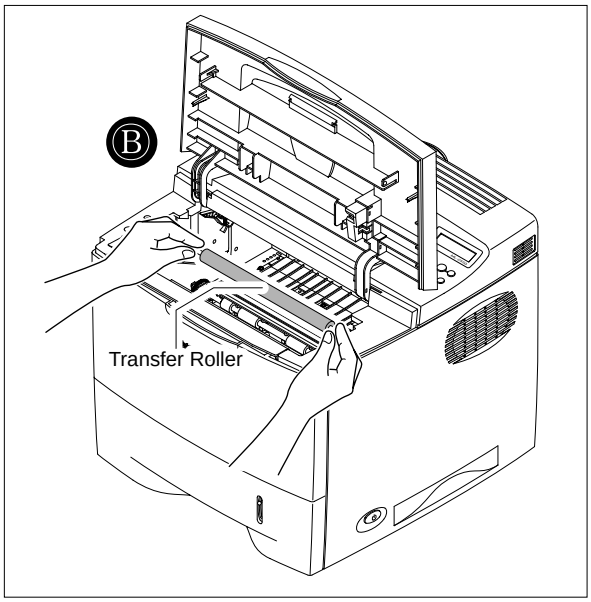


<Cautions When Replacing a Transfer Roller>

* Do not grab the transfer roller shown in picture (A). It may cause a malfunction due to a foreign object.
* Hold the both sides of the transfer roller shown in picture (B) when replacing it.



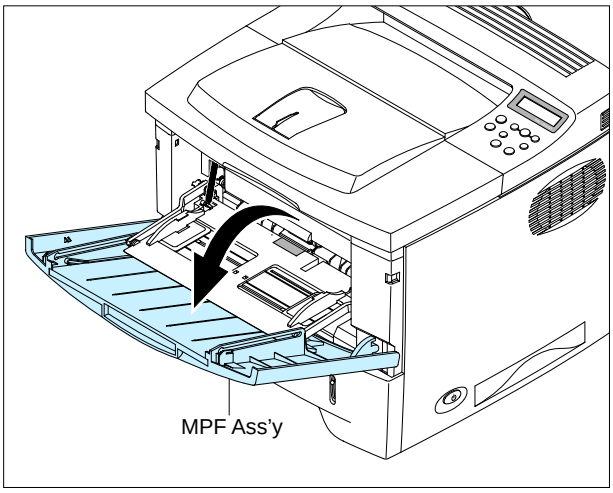
(A)



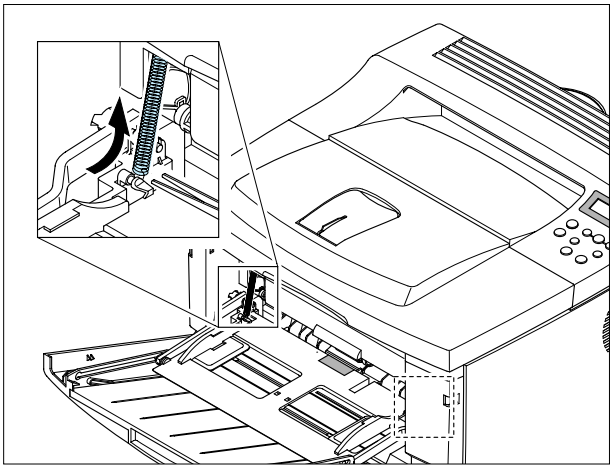
(B)

5.3 MPF Ass'y

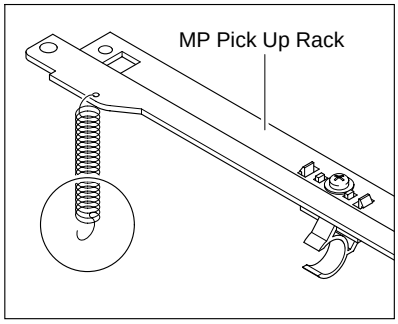
1. Open the MPF Ass'y.



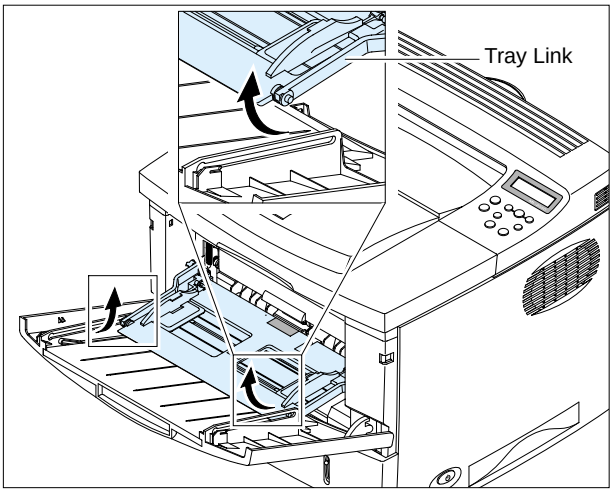
2. Remove two springs from the Knock Up Plate Ass'y.



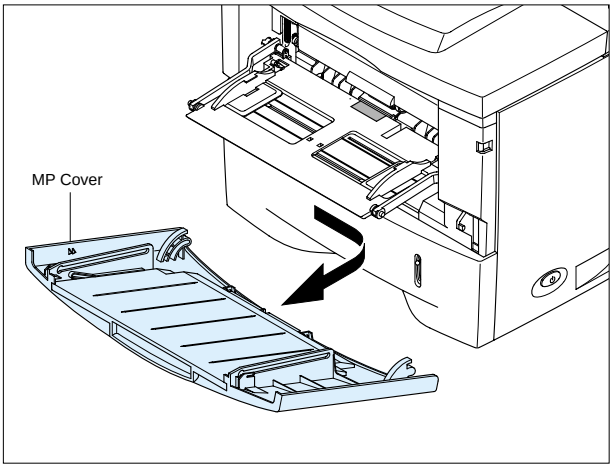
⚠ *NOTICE : Do not separate the spring from the MP Pick-up rack for convenience of assembling. Locate the hook section of the spring that is connected to the Knock Up Plate ass'y as shown in the picture below toward the outside for convenience of assembling.*



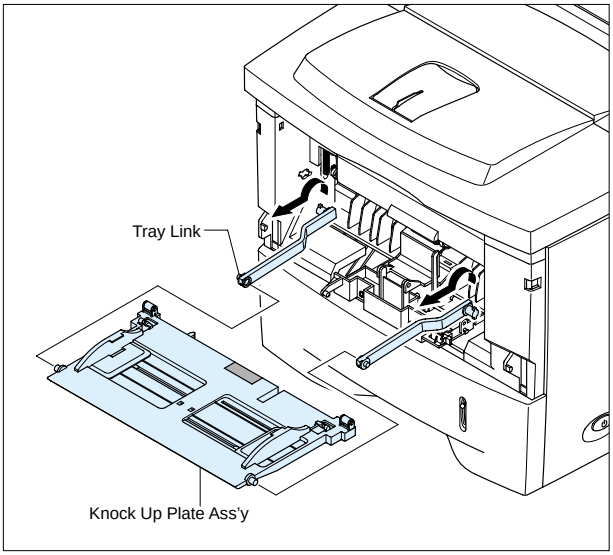
3. Remove the Tray Links from the MP Cover



4. Push the MP Cover and remove it as shown below.

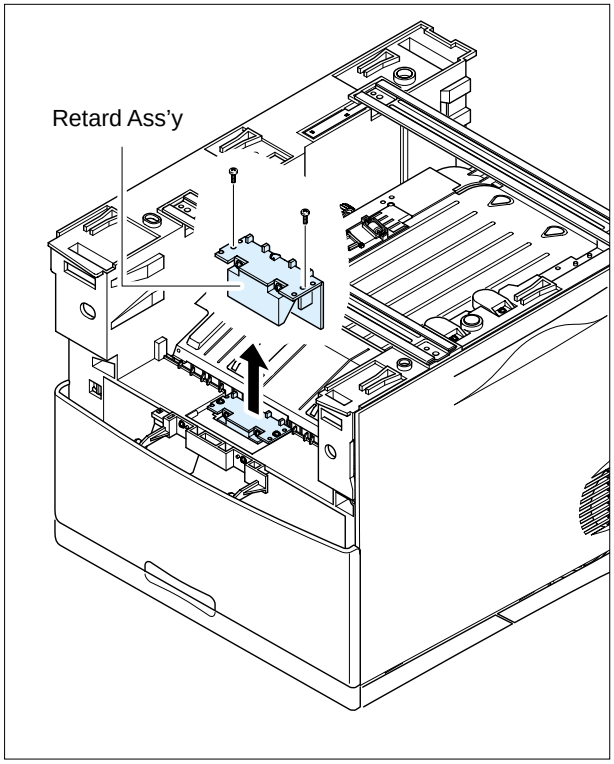


5. Remove MP Cover in the direction of arrow

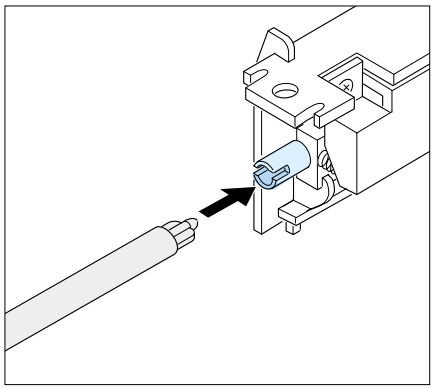


5.4 Retard Ass'y

1. Remove two screws. Then lift the Roller Ass'y, as shown below.

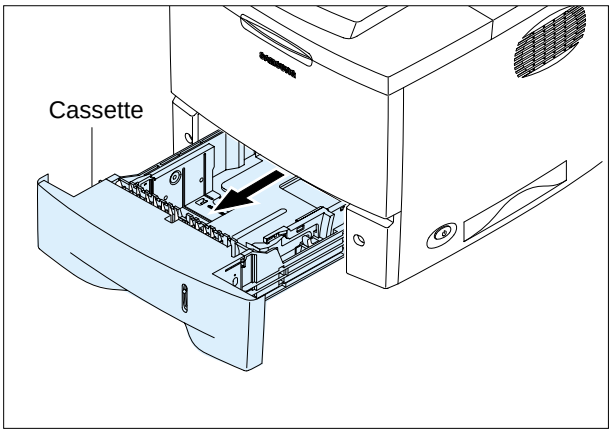


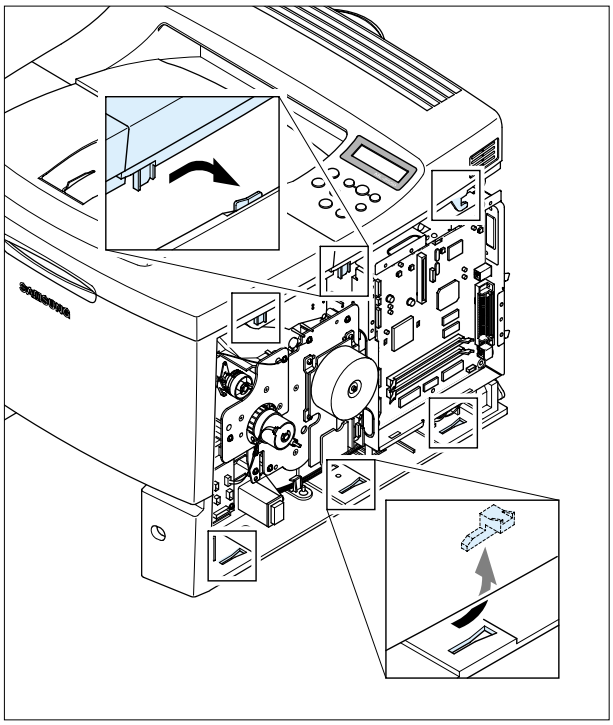
⚠ *Notice: When you reassemble the Retard Roller ass'y make sure that the let and of the Retard roller fits into the Retard shaft.*



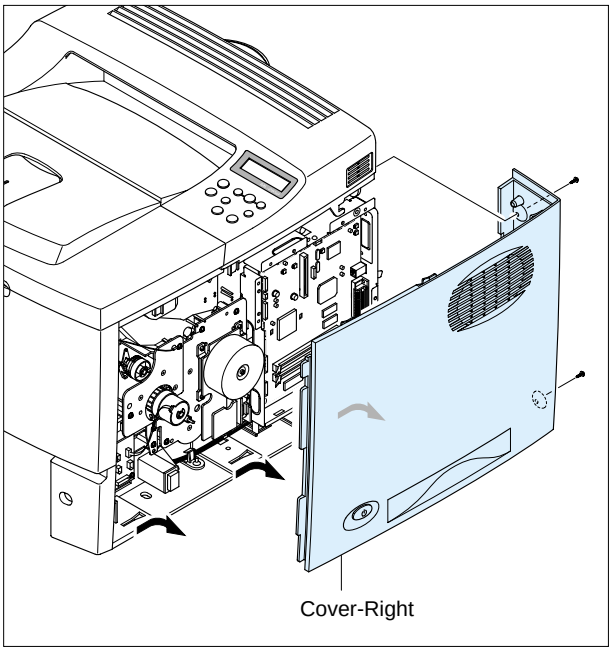
5.5 Cover-Right

1. Pull the Cassette out of the printer.





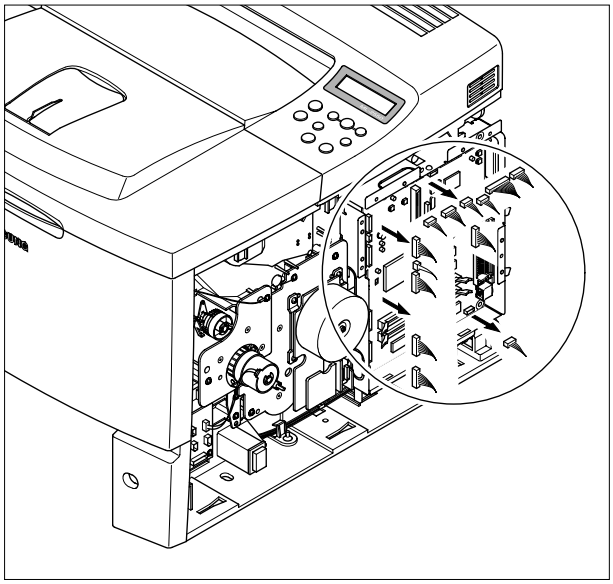
2. Remove two screws and take out the Right Side.



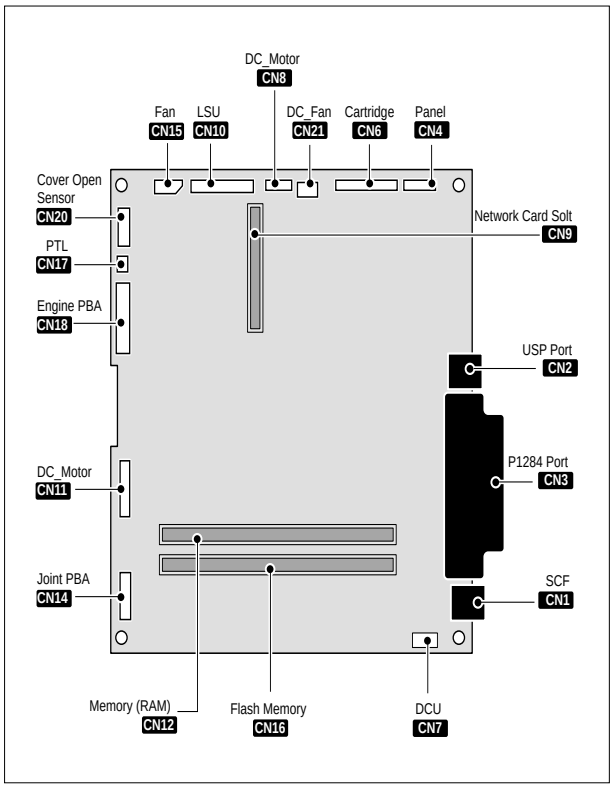
5.6 Main PBA

1. Before you remove the Main PBA you should remove:
   - Cover-Right (Refer to the 5.5)

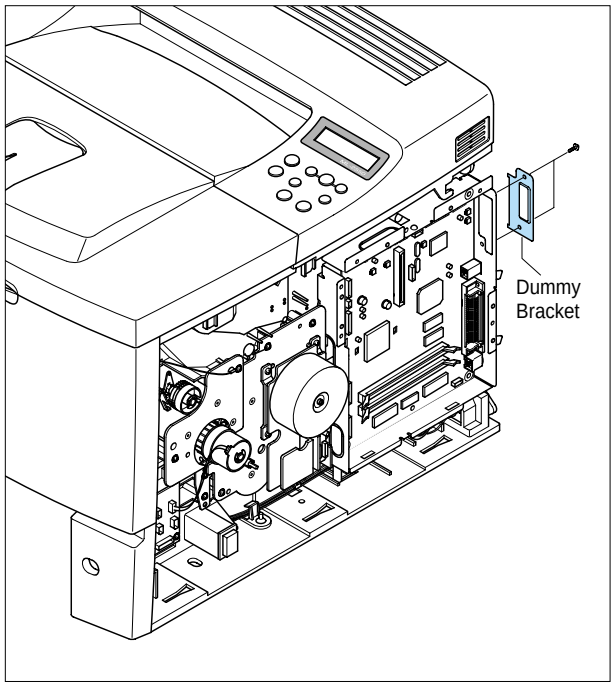
2. Unplug all the connectors, as shown below.



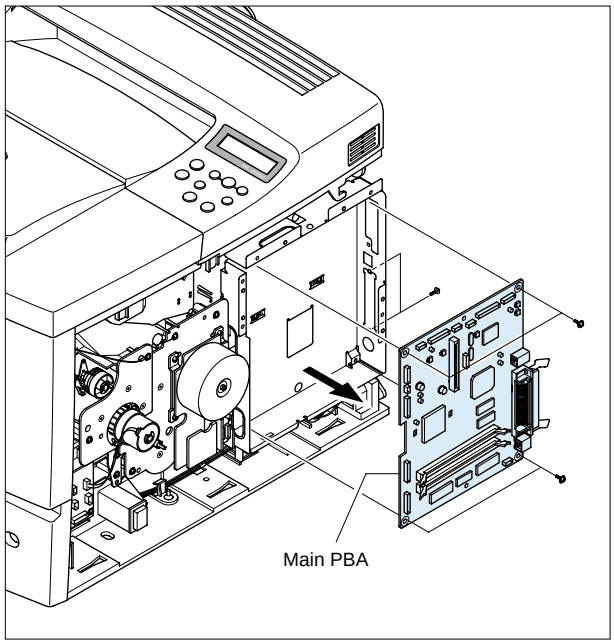
3. The connectors are located as shown below.



4. Remove two screws and take out the Dummy Bracket.



5. Remove six screws and take out the Main PBA.

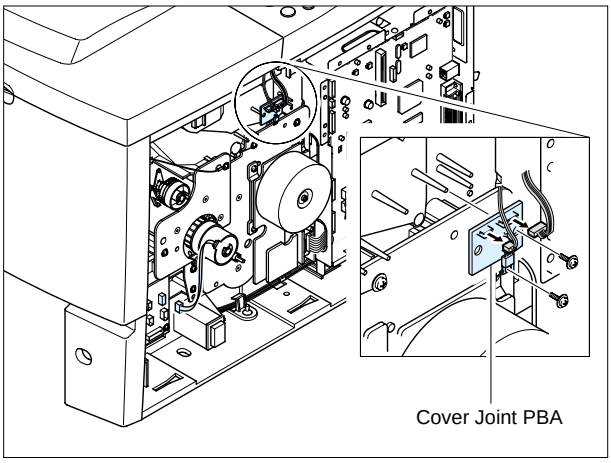


⚠ *NOTICE : One screw among the screws is locked on the Engine Shield.(Refer to 5.25.3)*

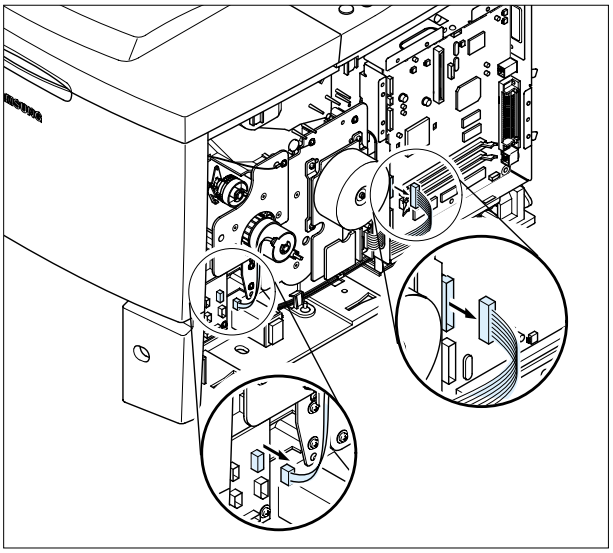
5.7 Main Drive Ass'y

1. Before you remove the Right Side Ass'y, you should remove:
   - Cover-Right (Refer to the 5.5)

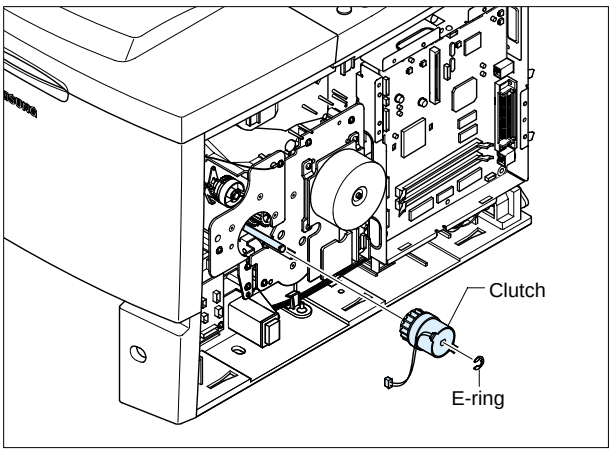
2. Unplug the two Connectors after you remove the two screws and take out the Cover Joint PBA.



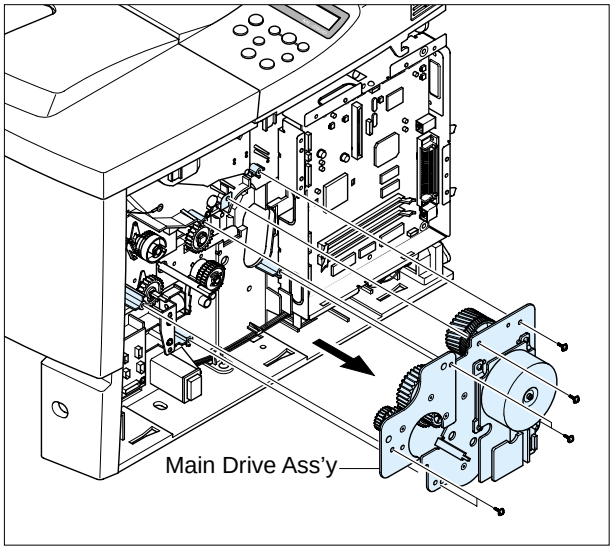
3. Unplug the two connectors from the Main PBA and the Connector PBA.



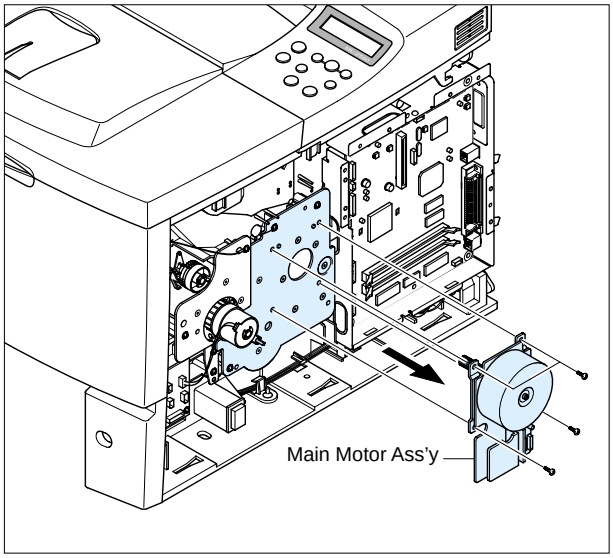
4. Remove the E-ring and take out the Clutch.



5. Remove six screws and take out the Main Drive Ass'y.



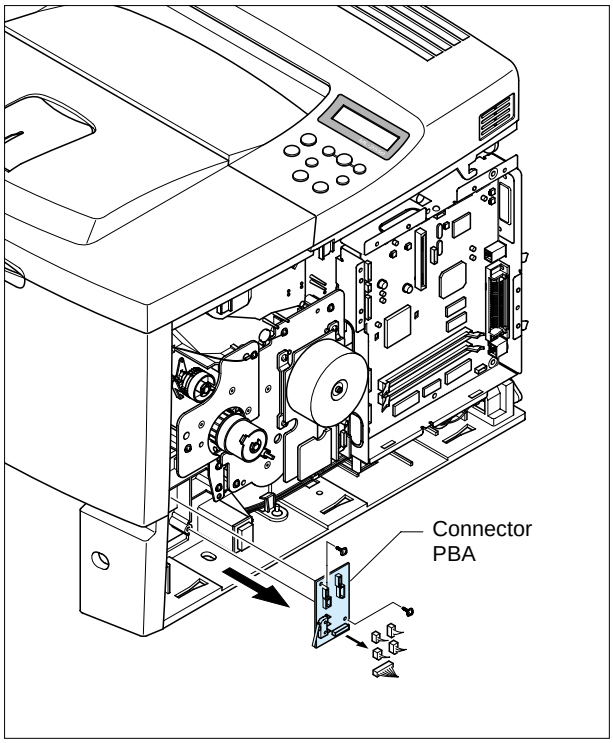
6. When separating the Main Motor ass'y, disconnect the connector form the Main PBA, remove 4 screws, and then remove the Main Motor ass'y.



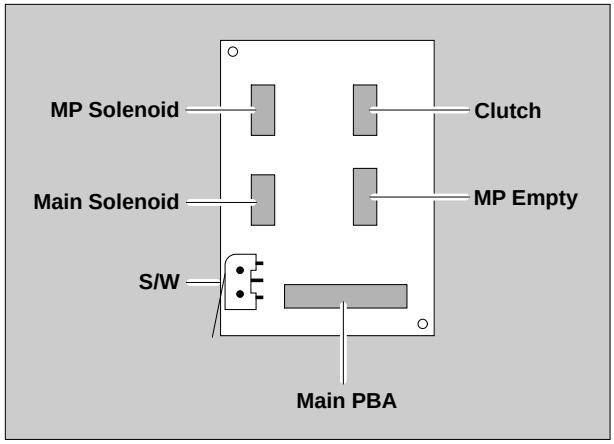
5.8 Connector PBA

1. Before you remove the Connector PBA, you should remove:
   - Cover-Right (Refer to the 5.5)

2. Unplug all of the connectors from the Connector PBA and take it out.



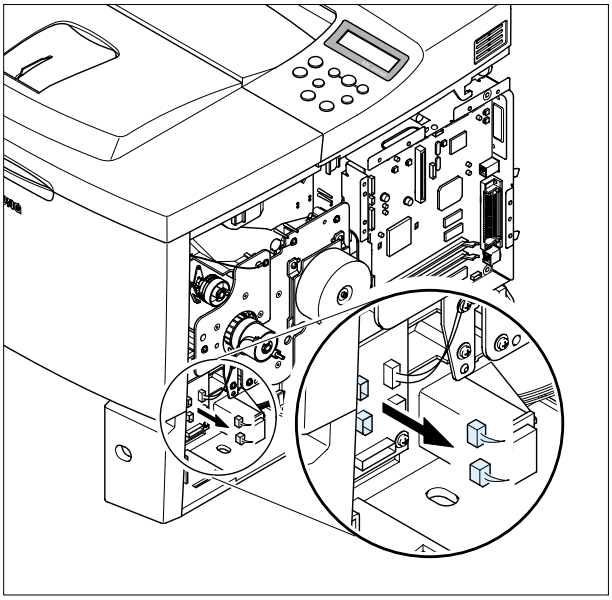
3. The connectors are located as shown below.



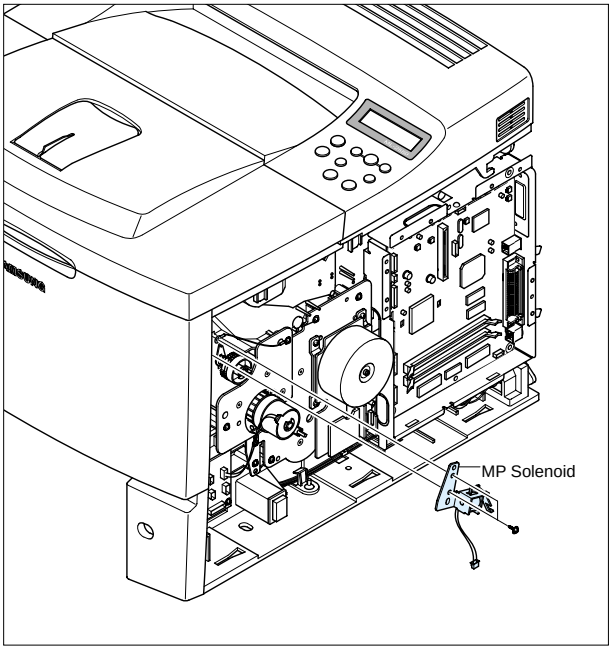
5.9 Solenoid

1. Before you remove the Connector PBA, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Main Drive Ass'y (Refer to the 5.7)

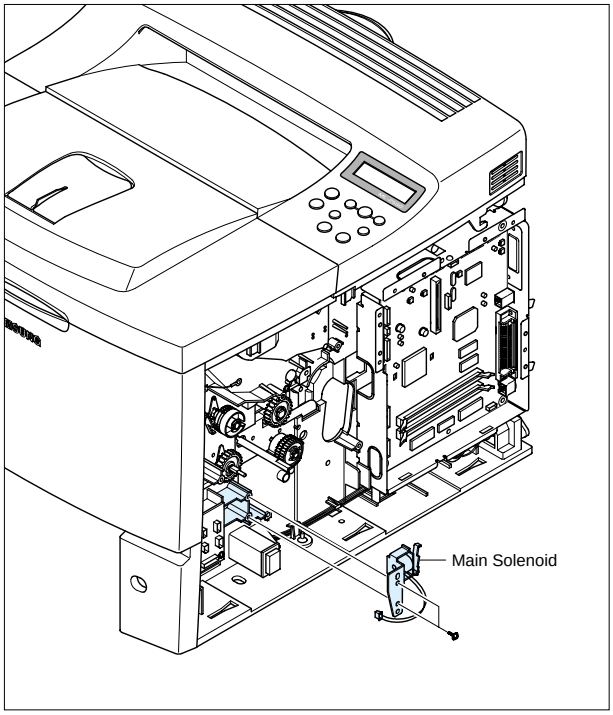
2. Unplug the MP Solenoid Harness and the Main Solenoid Harness from the Connector PBA.



3. Remove two screws and take out the MP Solenoid.



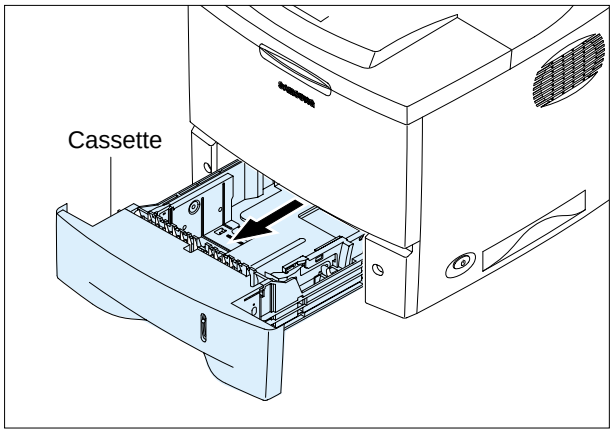
4. Remove two screws and take out the Main Solenoid.



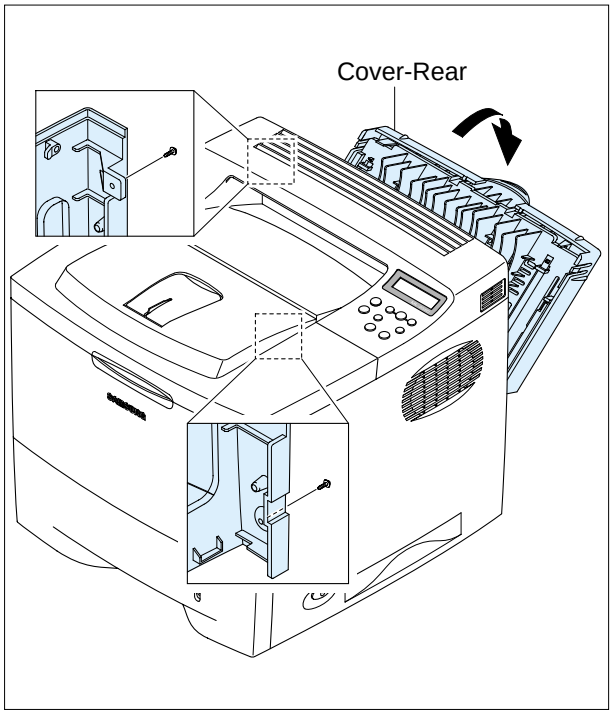
⚠ *NOTICE : It is not necessary to disassemble the Main Drive Ass'y to remove the MP Solenoid*

5.10 Cover-Left

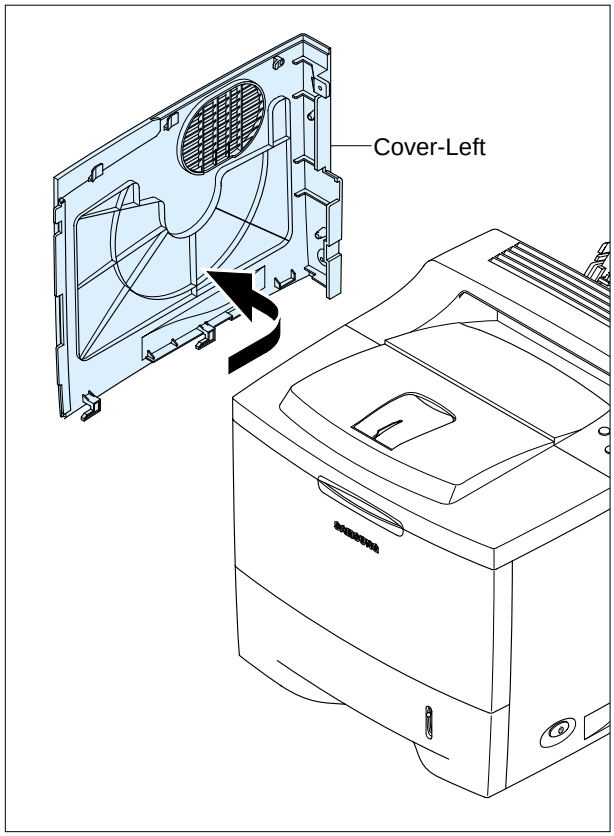
1. Pull the Cassette out of the printer.



2. Remove two screws and take out the Right Side.



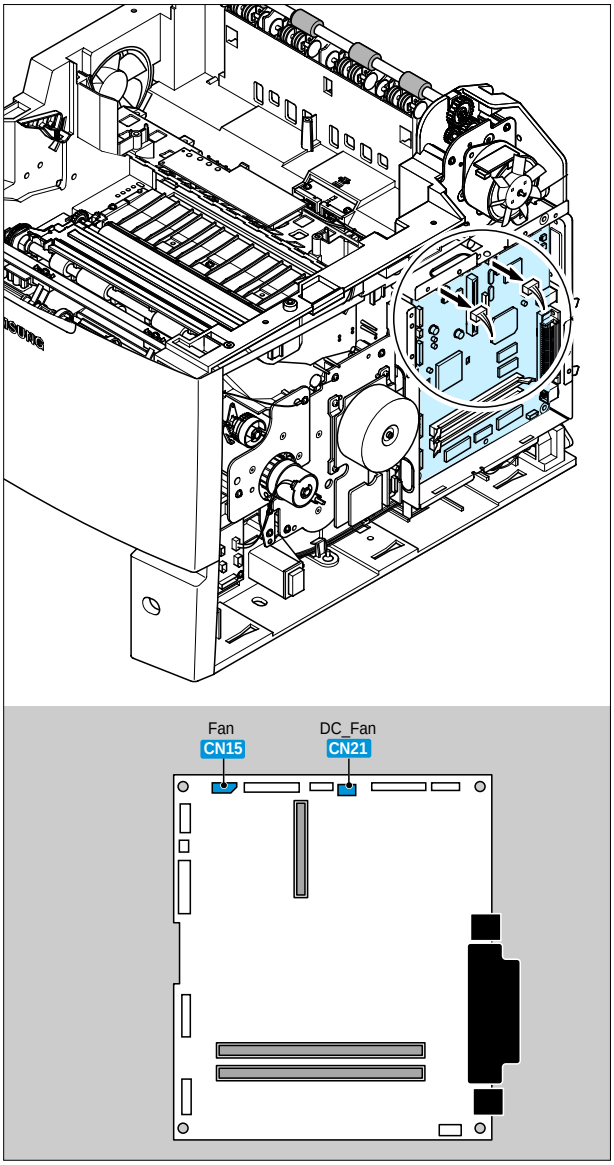
3. Remove two screws and take out the Cover-Left



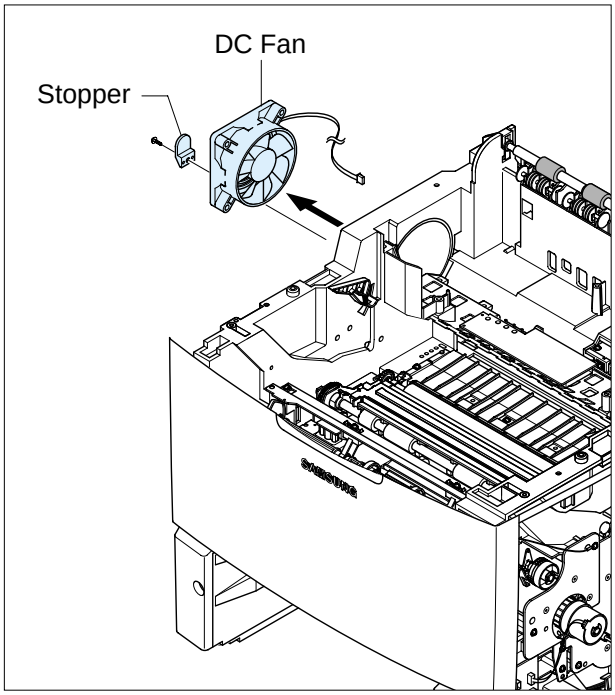
5.11 DC Fan

1. Before you remove the DC Fan, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Cover-Left (Refer to the 5.10)

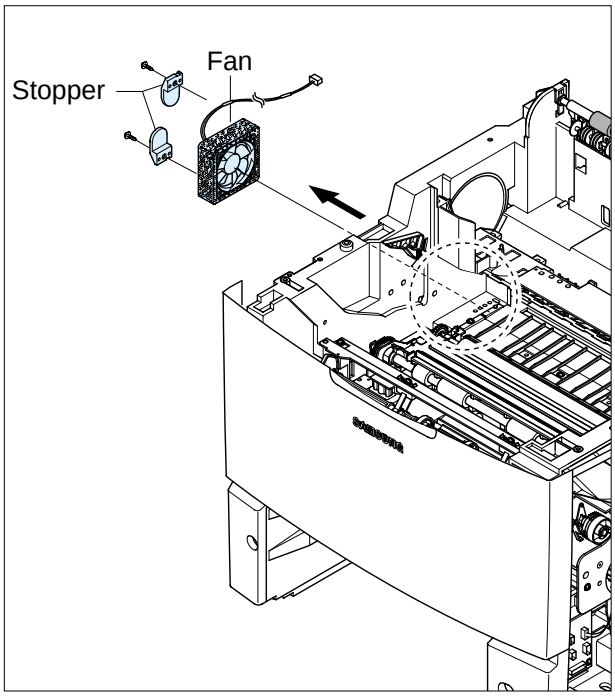
2. Unplug the two Connectors from the Connector PBA.



3. Remove one screw for taking out the Stopper, and then take out the DC Fan.

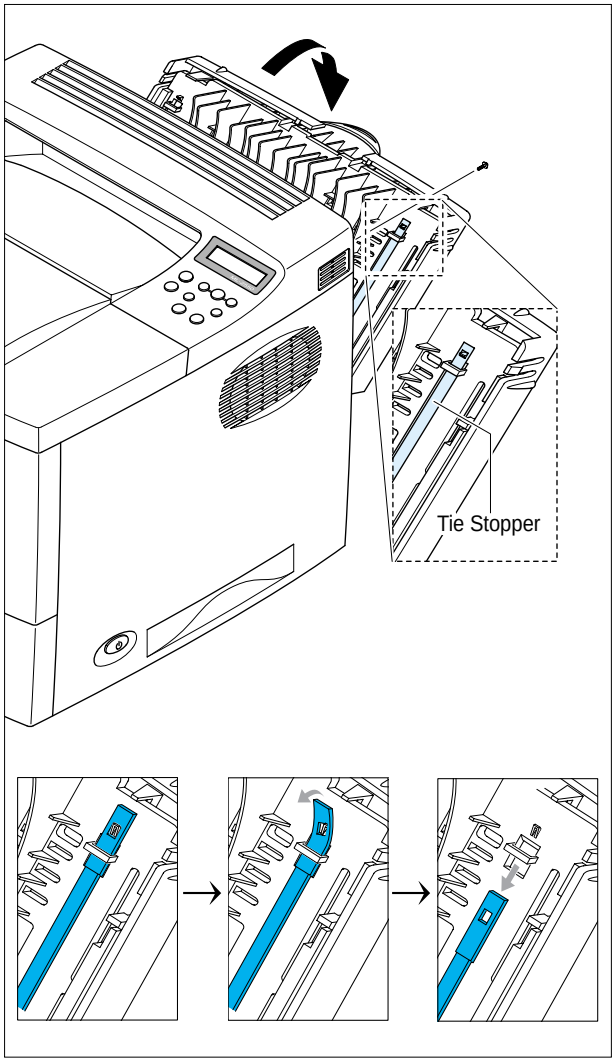


4. Remove two screw for taking out the Stoppers, and then take out the Fan.

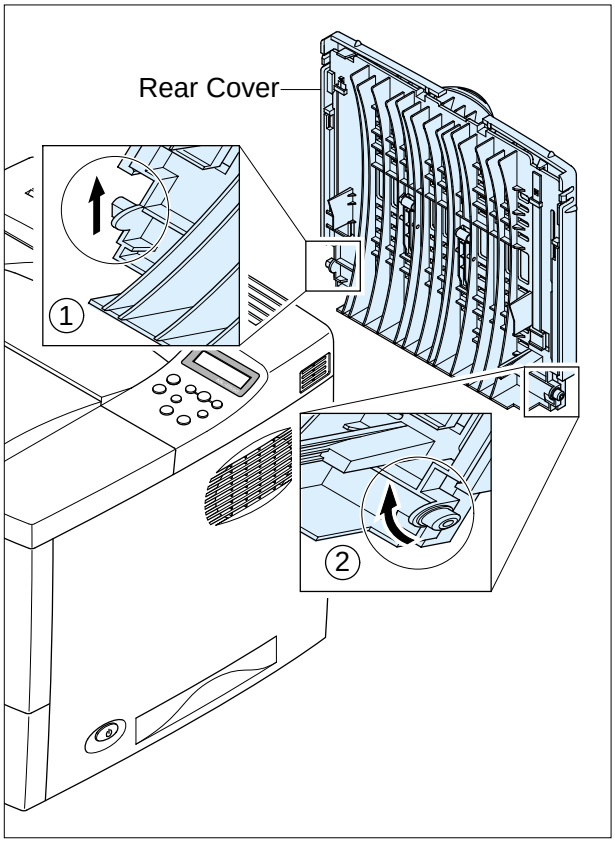


5.12 Rear Cover

1. Open the Rear Cover, and then take out the Stopper.



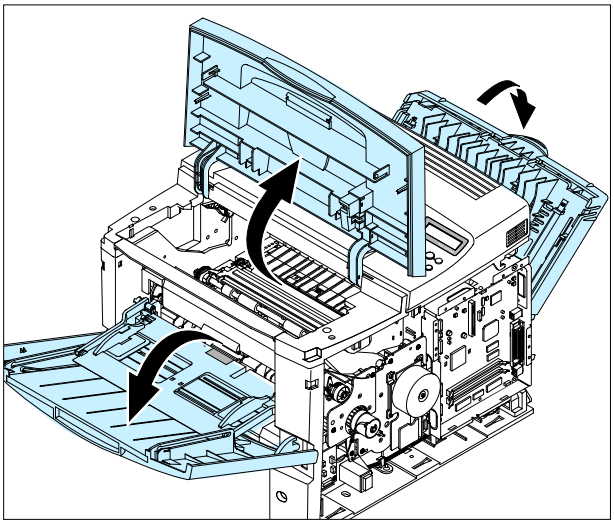
2. Remove the Rear Cover in the direction of arrow.



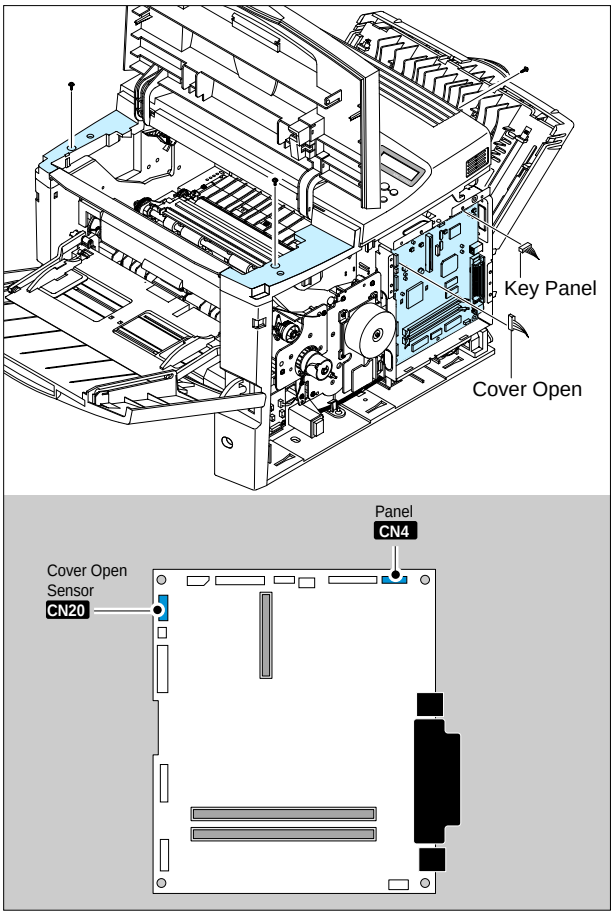
5.13 Top Cover

1. Before you remove the Top Cover, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Cover-Left (Refer to the 5.10)

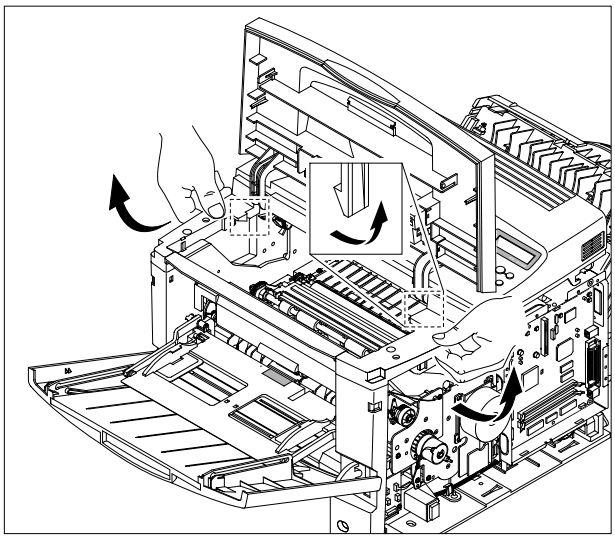
2. Open the MPF Ass'y, the Rear Cover, the Open Cover.



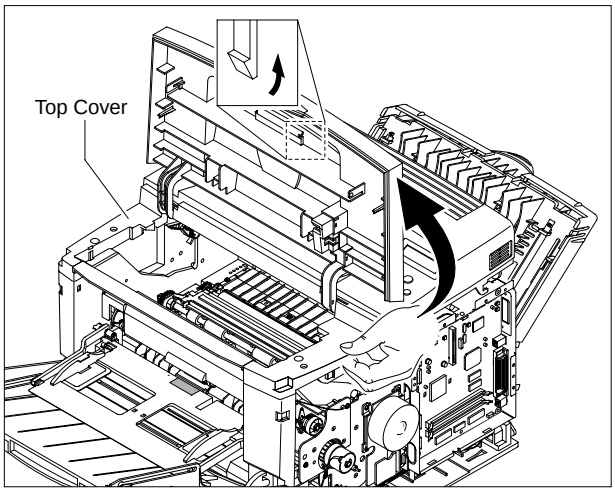
3. Unplug the two Connectors after you remove the three screws from the Main PBA.



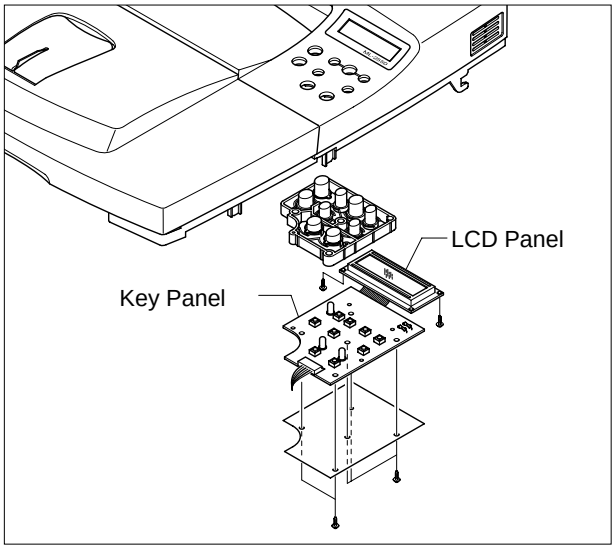
4. Unlatch both ends of the Top Cover.



5.Unlatch the hook and take out the Top Cover.



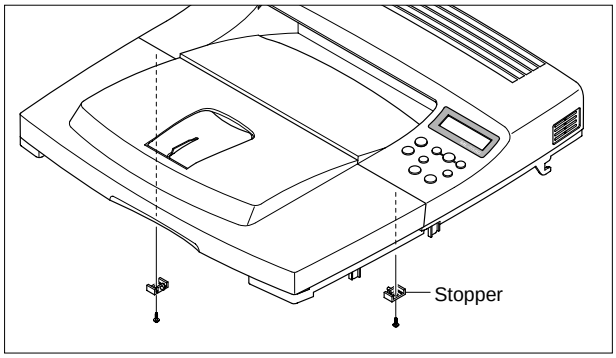
6. Remove 7 screws, and then take out the LCD Panel and the Key Panel.



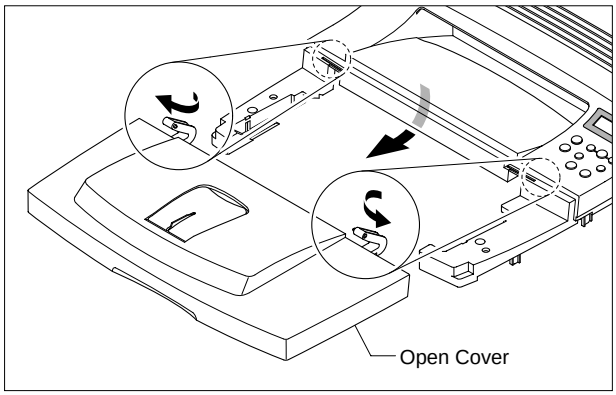
5.14 Open Cover

1. Before you remove the Open Cover, you should remove:
   - Top Cover (Refer to the 5.13)

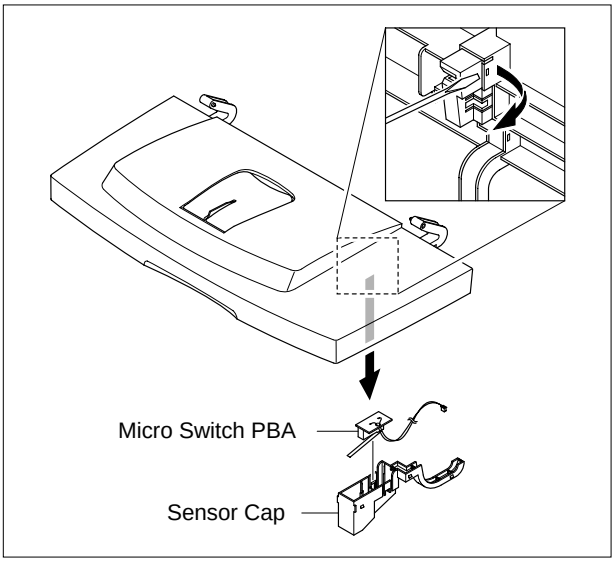
2. Remove two screws and take out the Stopper.



3. Take out the Open Cover as shown below.



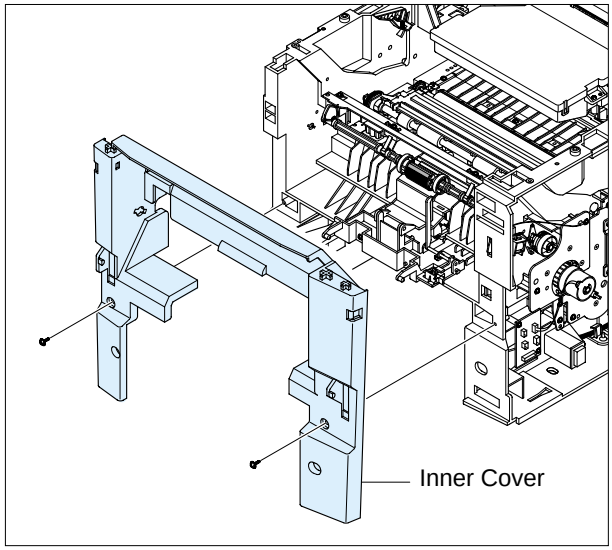
4. Release the lock as shown below and lift up the Sensor Cap.



5.15 Inner Cover

1. Before you remove the Inner Cover, you should remove:
   - MPF Ass'y (Refer to the 5.3)
   - Top Cover (Refer to the 5.13)

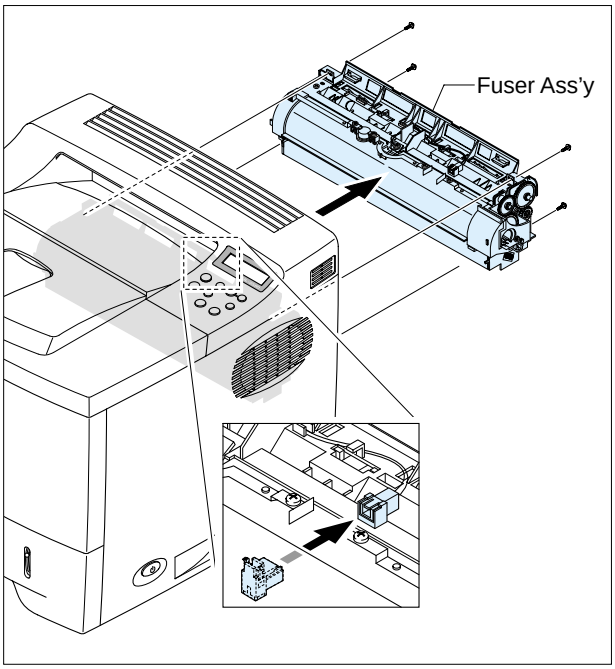
2. Remove two screws and take out the Inner Cover.



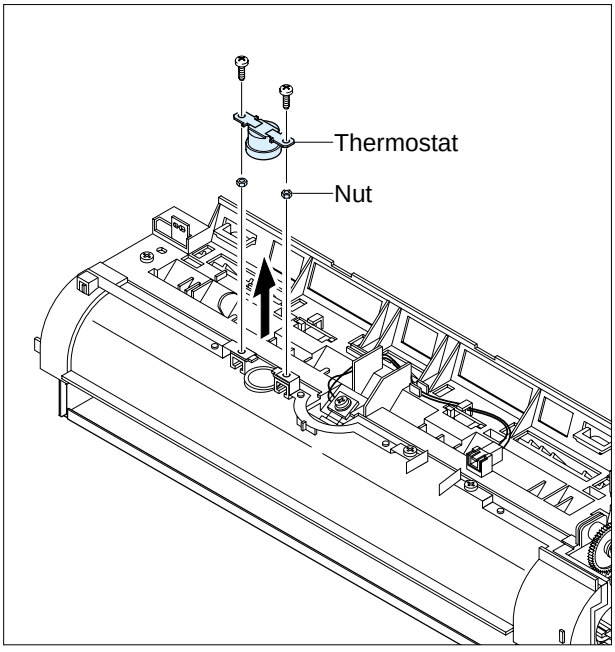
5.16 Fuser Ass'y

1. Before you remove the Fuser Ass'y, you should remove:
   - Rear Cover (Refer to the 5.12)

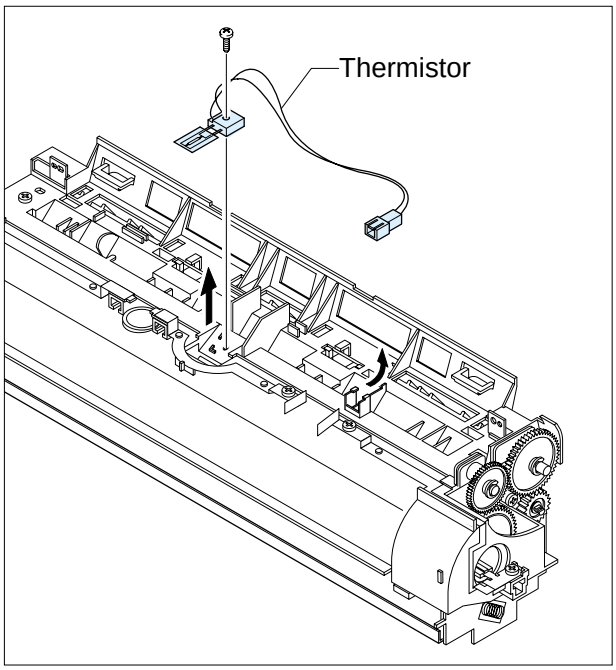
2. Remove four screws and take out the Fuser Ass'y.



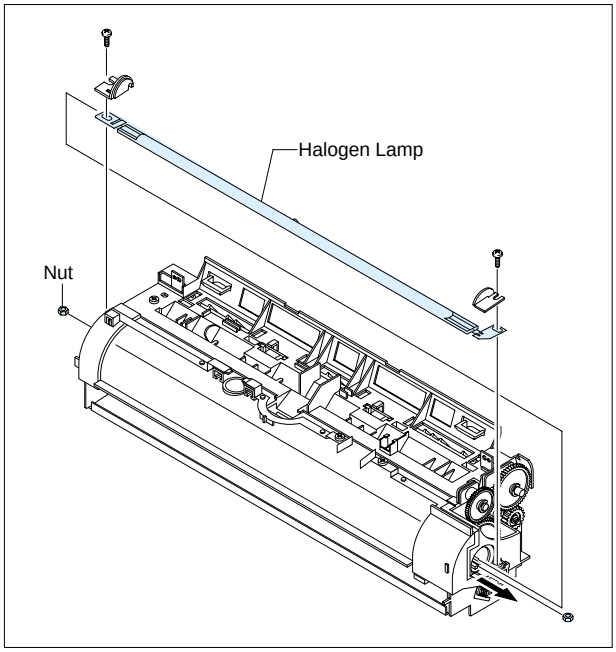
3. Remove two screws and take the Thermostat out of the Fuser Ass'y.



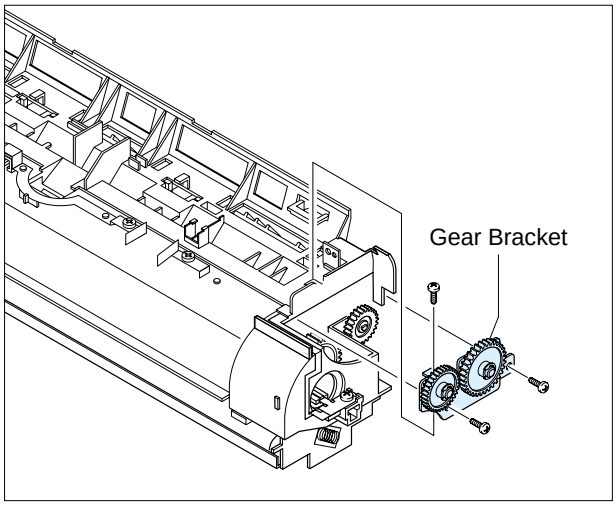
4. Remove one screw, and then take out the Thermistor from the Fuser Ass'y.



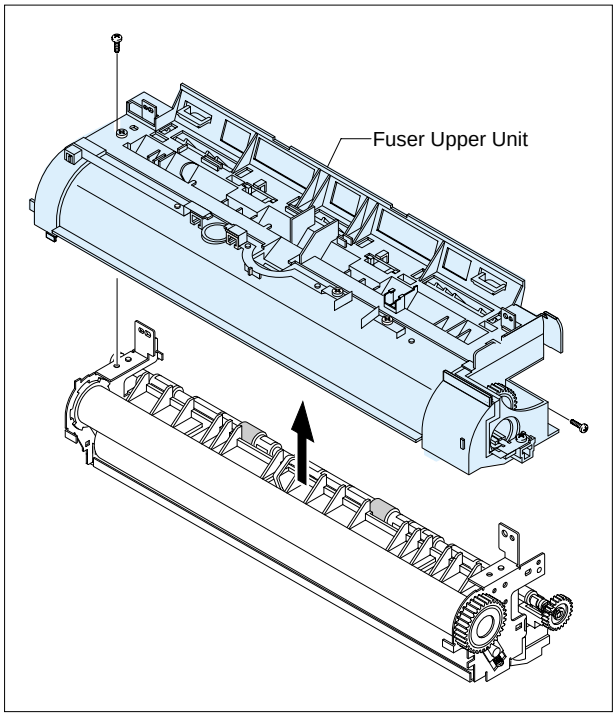
5. Remove two screws and take the Halogen Lamp out of the Heat Roller.



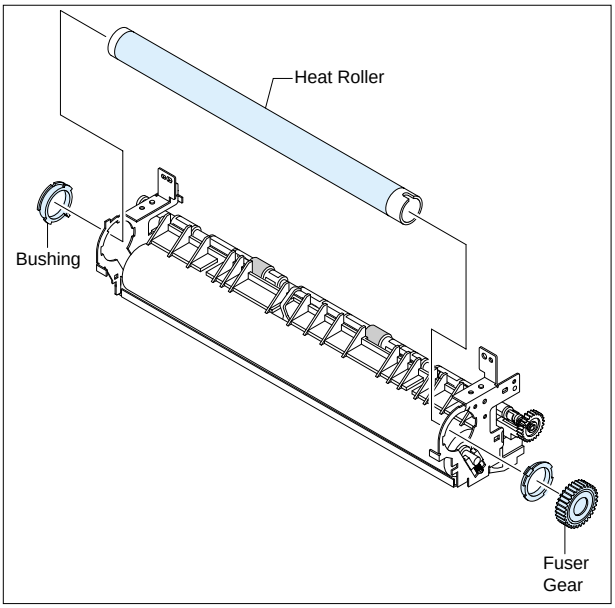
6. Remove three screws and take out the Gear bracket.



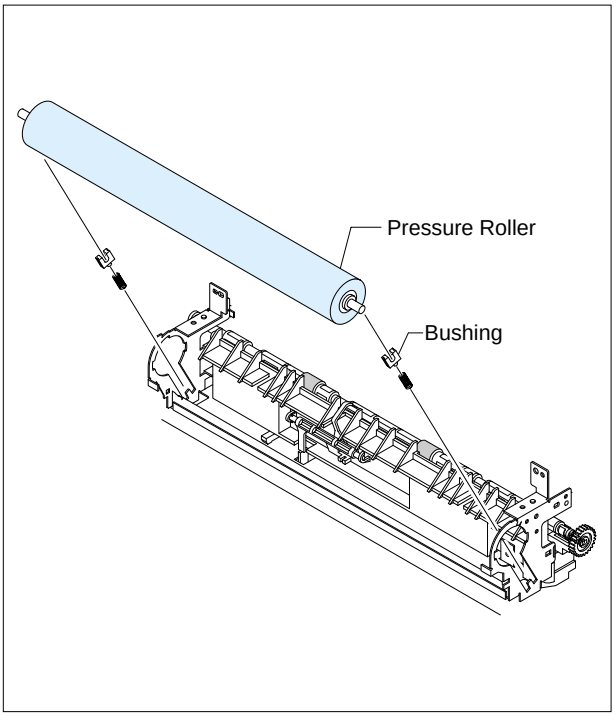
7. Remove two screws and divide the Fuser into two parts.



8. Take out the Heat Roller as shown below.



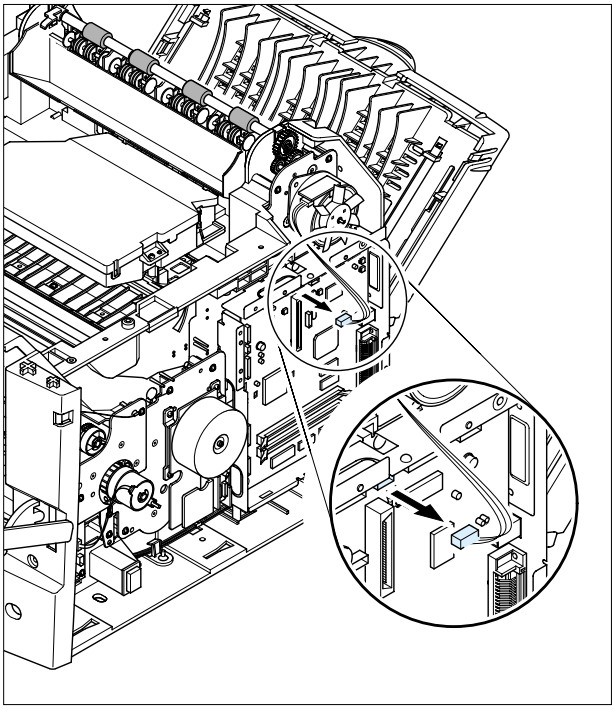
9. Take out the Pressure Roller as shown below.



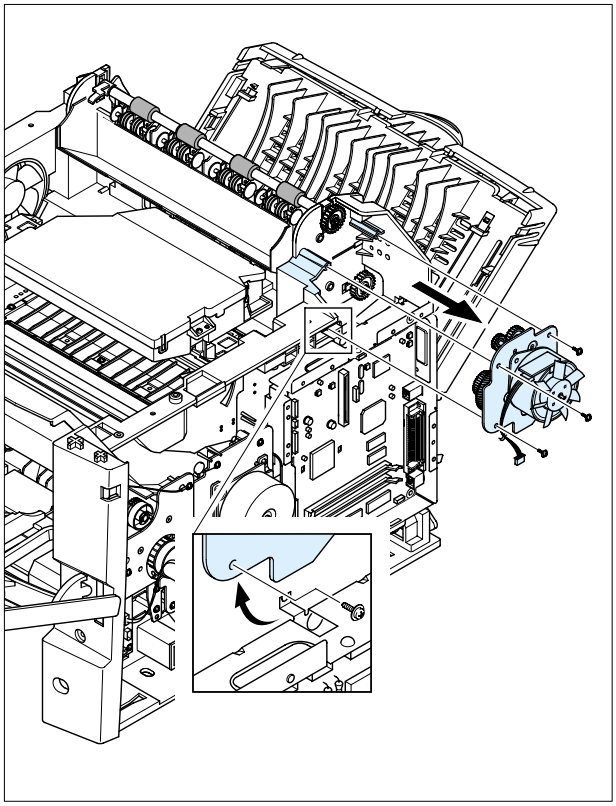
5.17 Exit Drive

1. Before you remove the Exit Driver, you should remove:
   - Top Cover (Refer to the 5.13)

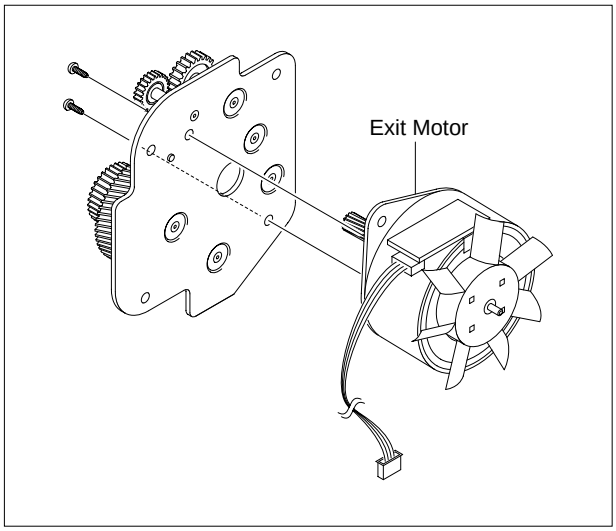
2. Unplug the Exit Driver Harness from the Main PBA.



3. Remove three screws and take out the Exit Driver Ass'y.



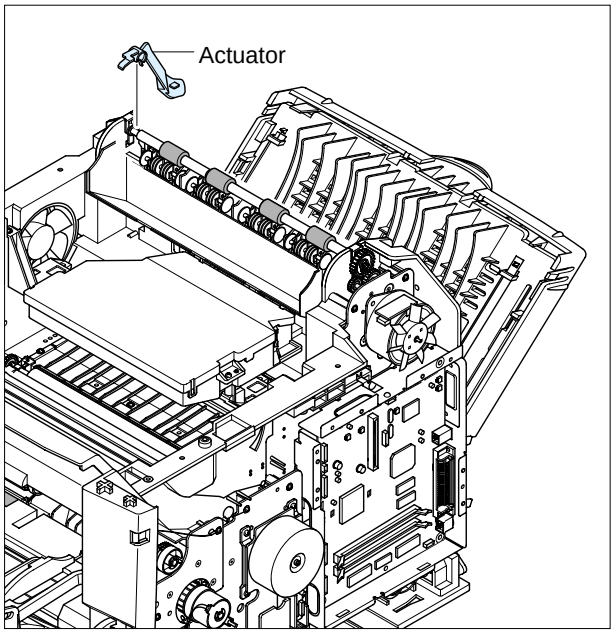
4.Remove two screws and take out the Exit Motor.



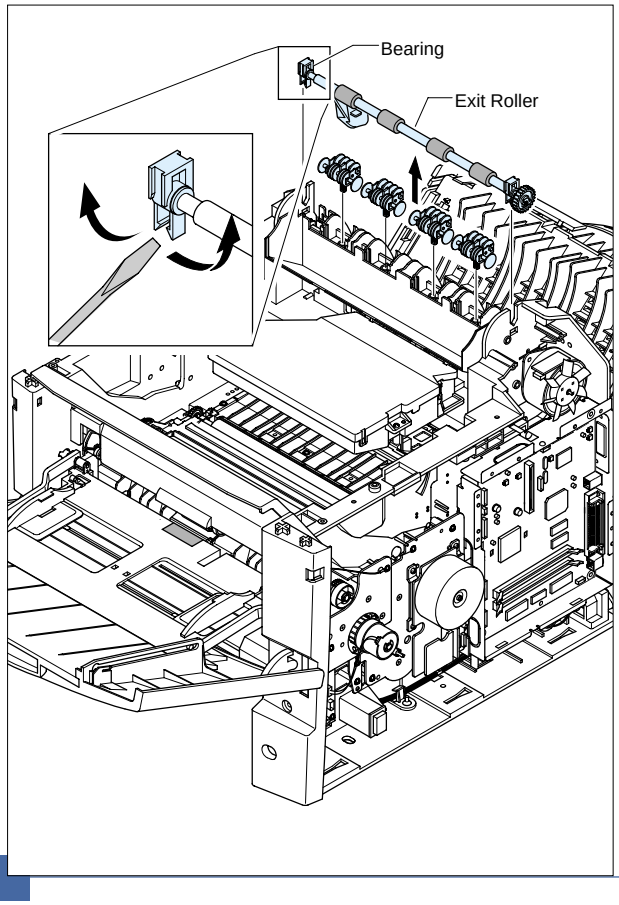
5.18 Exit Roller

1. Before you remove the Exit Roller, you should remove:
   - Top Cover (Refer to the 5.13)

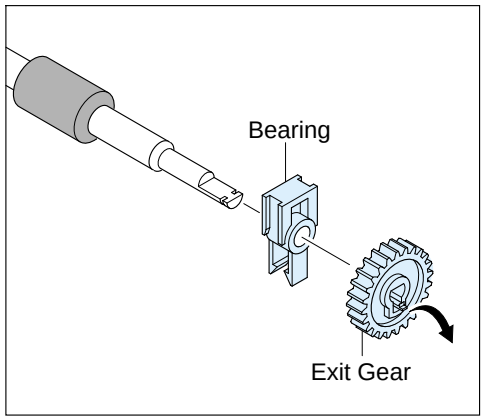
2. Take the Actuator out.



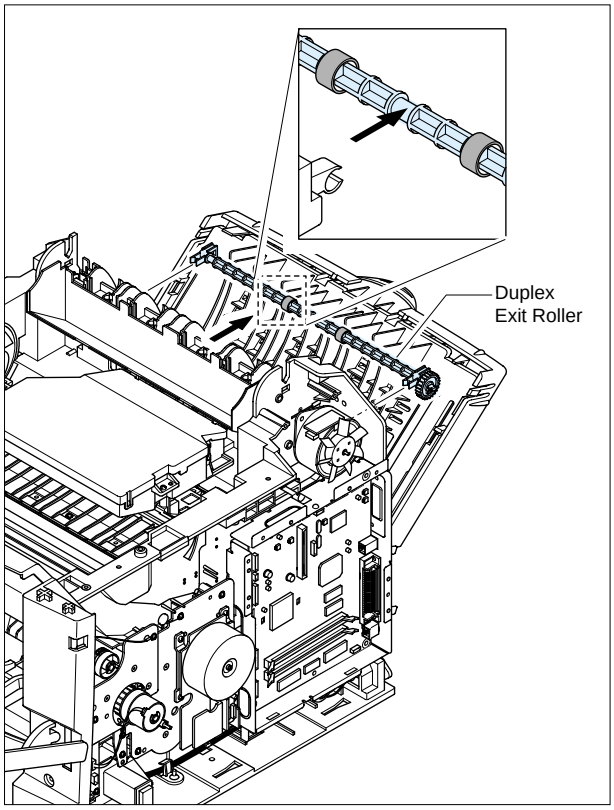
3. Remove the Exit Roller and Bearing as shown below.



4 Take out the Exit Gear as shown below.



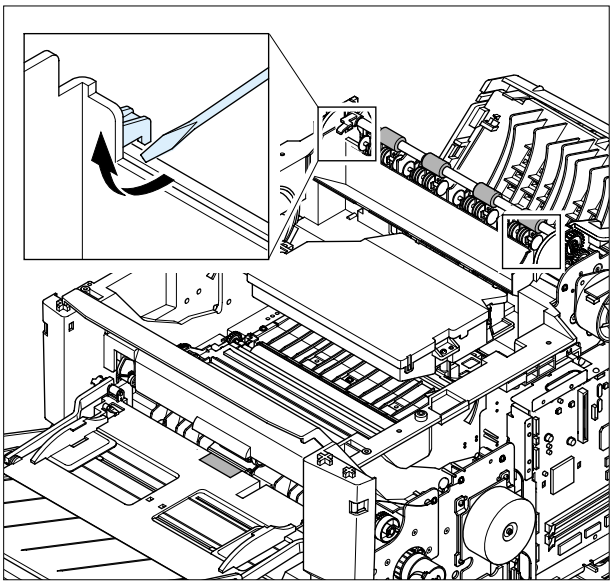
5. Take out the Duplex Exit Roller as same method.



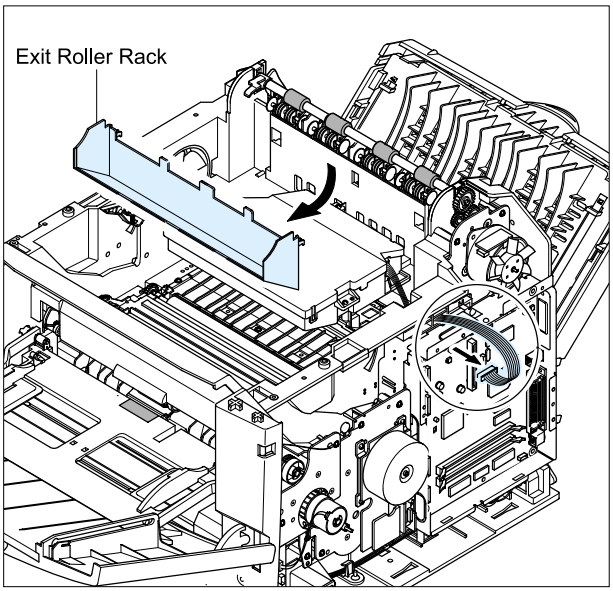
5.19 LSU

1. Before you remove the LSU, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Cover-Left (Refer to the 5.10)
   - Top Cover (Refer to the 5.5)

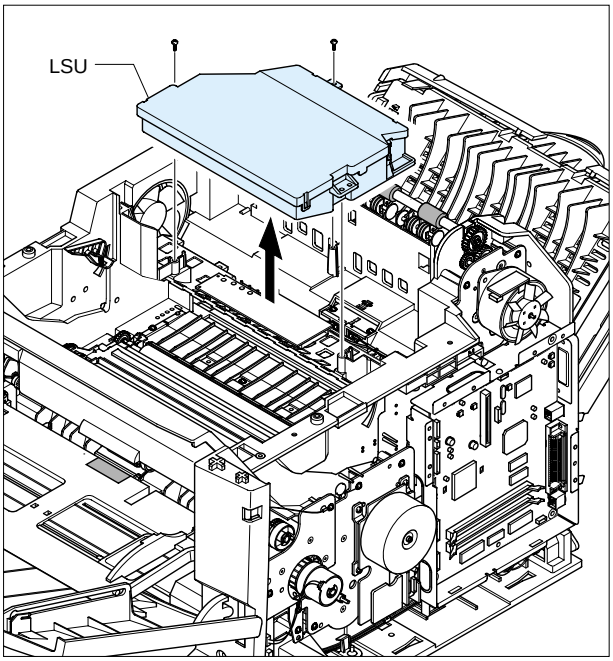
2. Release the lock as shown below.



3. Remove the Exit Roller Rack in the direction of arrow.



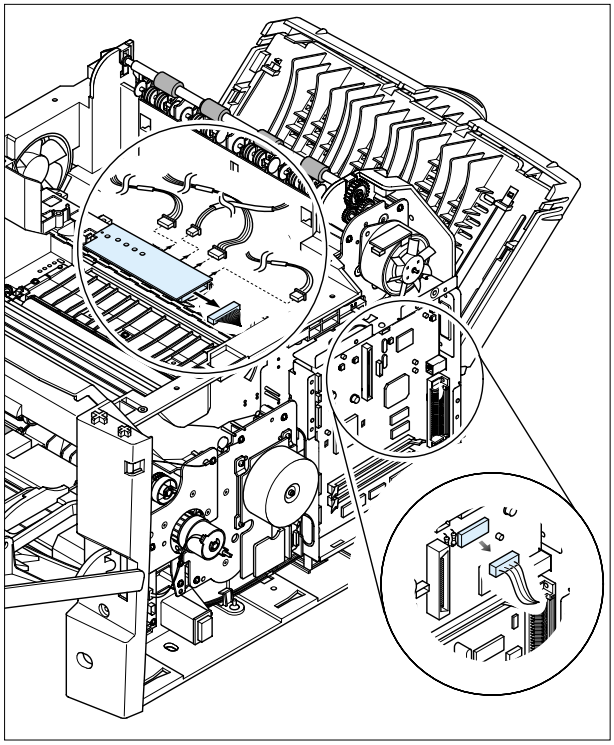
4. Remove three screws and take out the LSU.



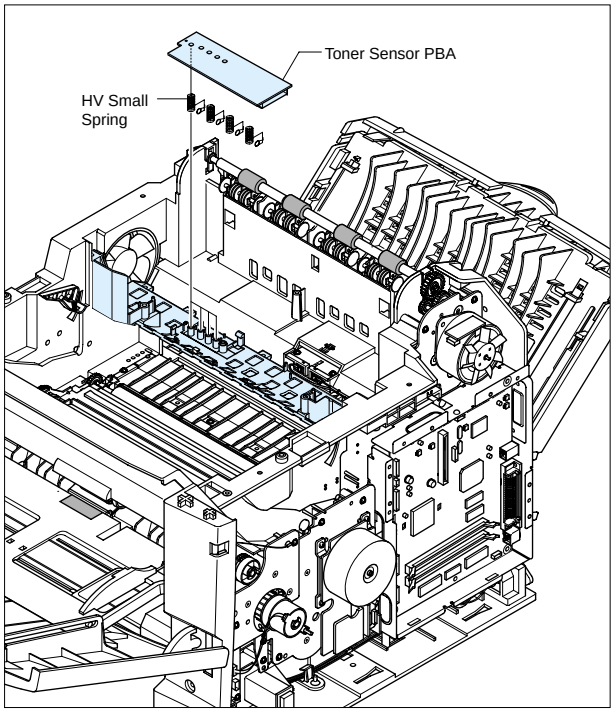
5.20 Toner Sensor Board

1. Before you remove the Toner Sensor Board, you should remove:
   - Top Cover (Refer to the 5.13)
   - LSU (Refer to the 5.19)

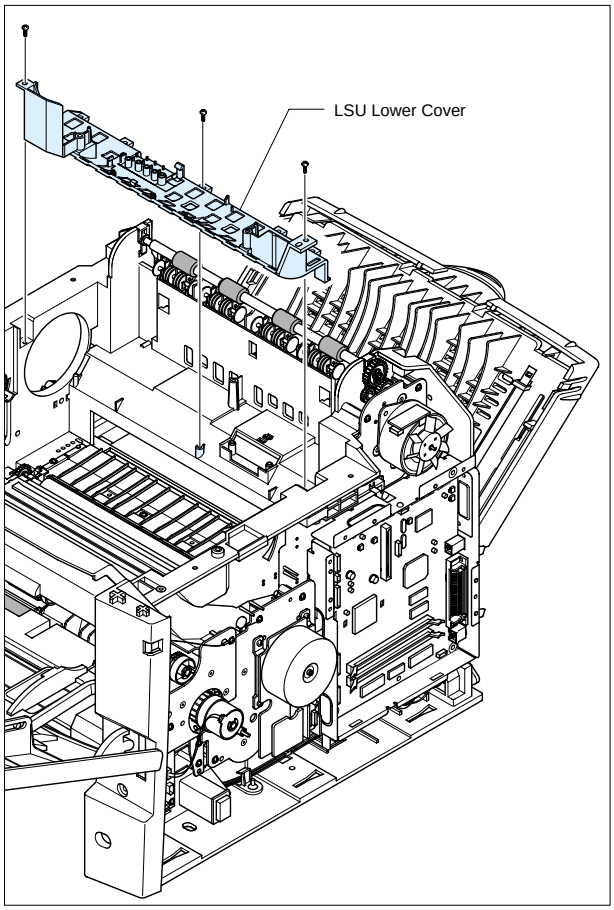
2. Unplug 5 Harness from the Toner Sensor PBA.



3. Take out the Toner Sensor PBA.



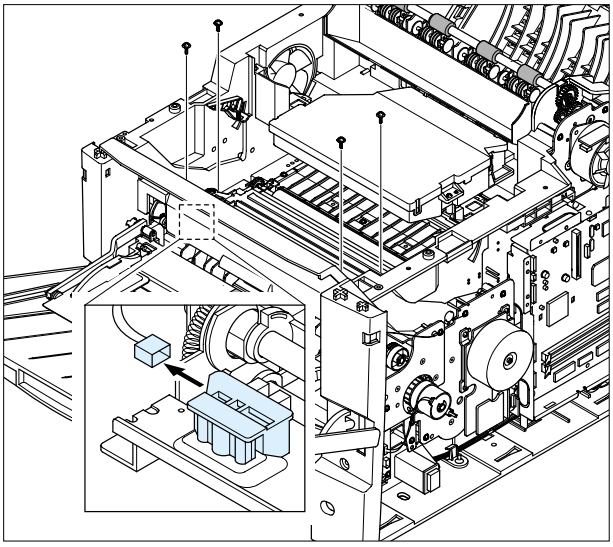
4. Remove 3 screws and take out the LSU Lower Cover.



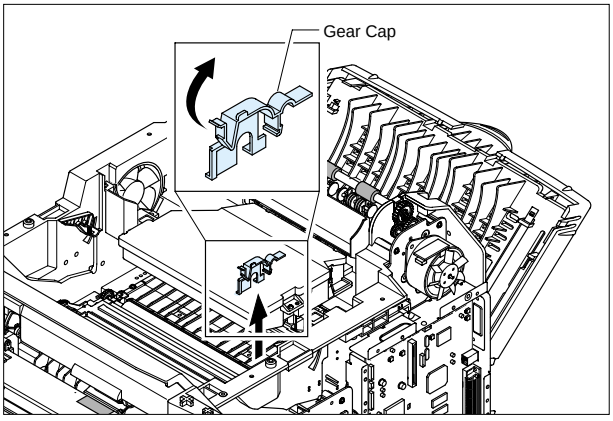
5.21 REGI Ass'y

1. Before you remove the REGI Ass'y, you should remove:
   - Top Cover (Refer to the 5.13)

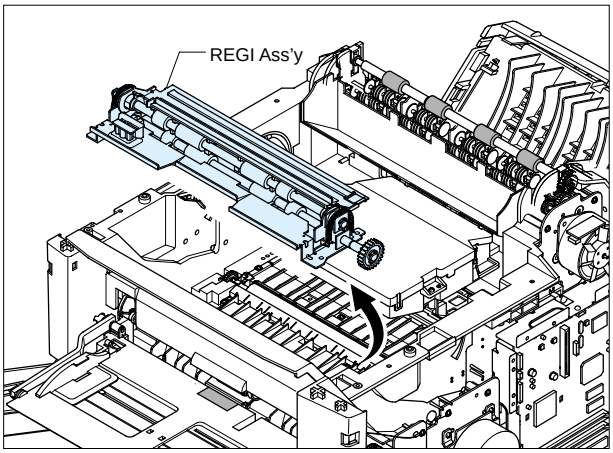
2. Unplug the Harness, Remove 4 screws.



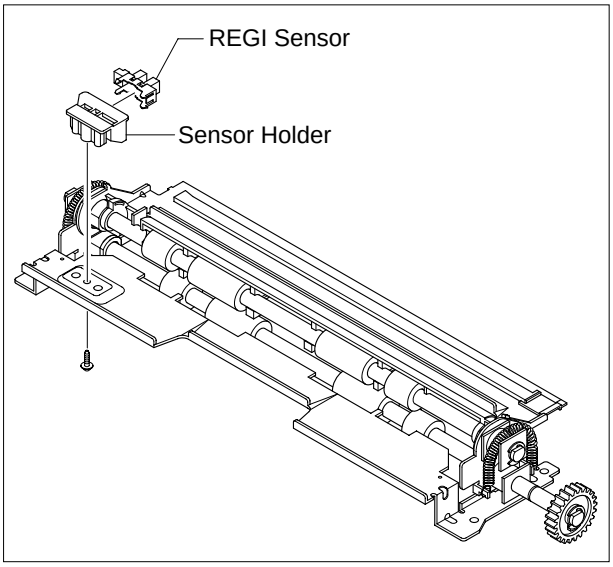
3. Release the lock as shown below and lift up the Gear Cap.



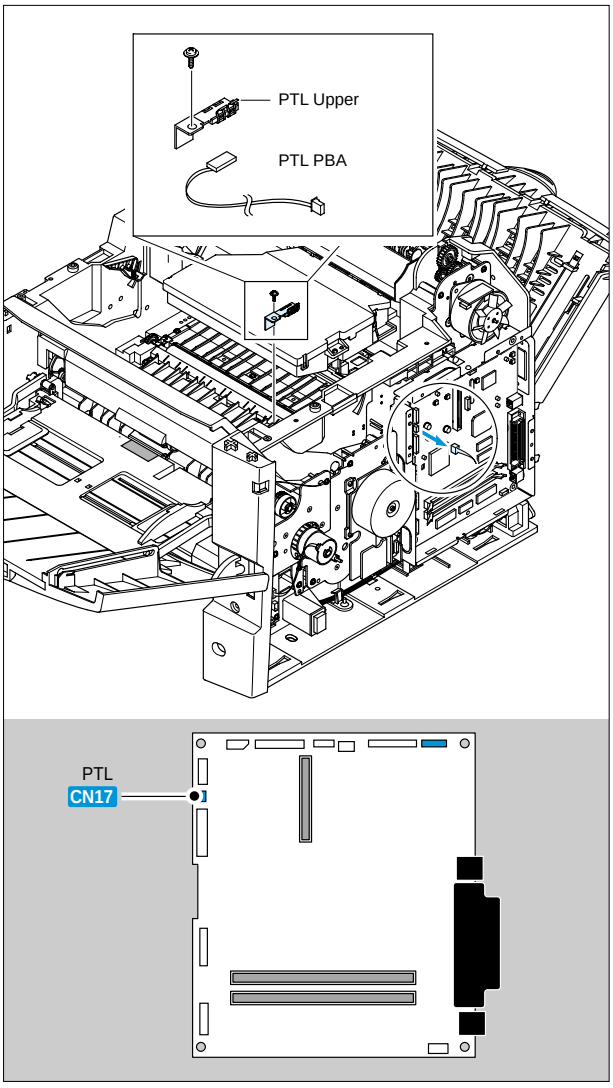
4. Take out the Regi. Ass'y as shown below.



5. Remove one screw and take out the Regi. Sensor.



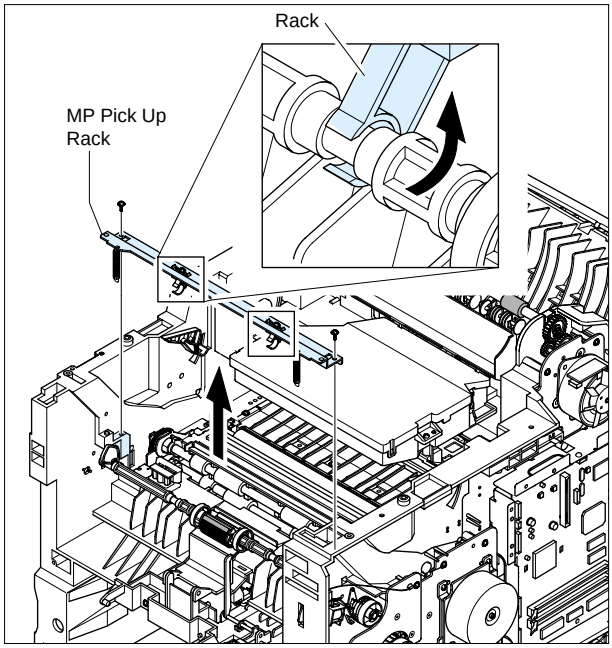
6. Unplug the Harness, remove one screw and take out the PTL PBA.



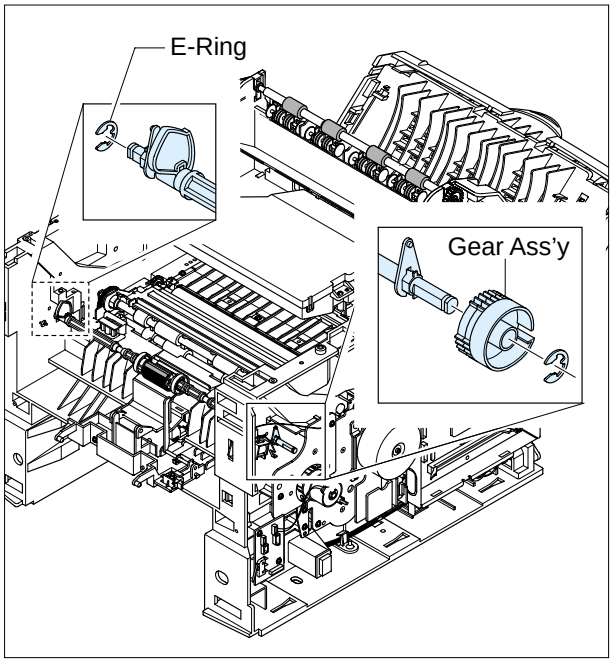
5.22 MP Pick-up Ass'y

1. Before you remove the MP Pick-up Ass'y, you should remove:
   - MPF Ass'y (Refer to the 5.3)
   - Main Drive Ass'y (Refer to the 5.7)
   - Top Cover (Refer to the 5.13)
   - Inner Cover (Refer to the 5.15)

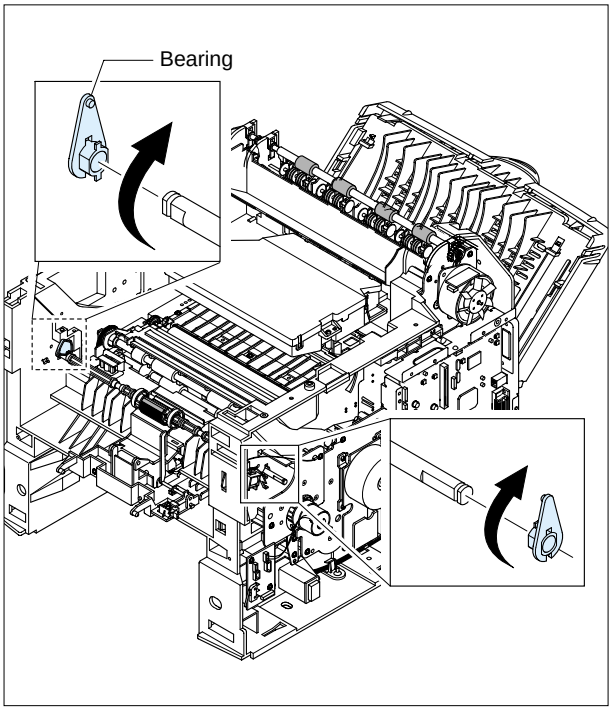
2. First of all remove two screws. Lift up the MP Pick-up Shaft for taking out the MP Pick-up Rack.



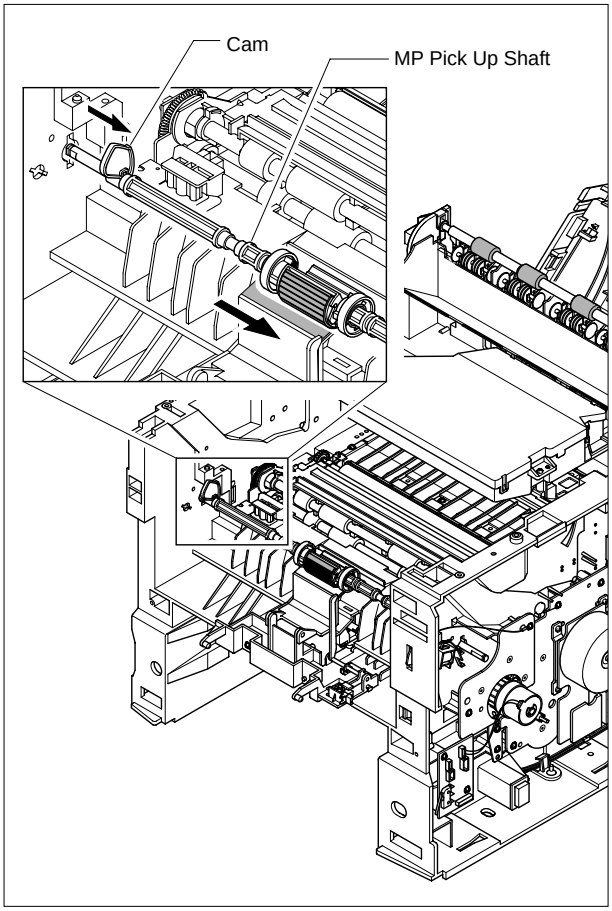
3. Remove the E-Rings on both ends of Gear Ass'y and remove Ass'y as shown below.



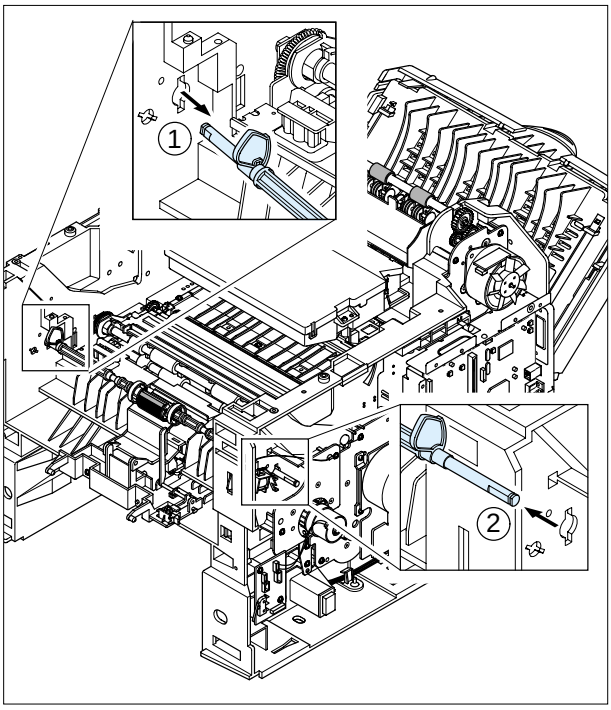
4. Pull and remove the lock equipment, then rotate the Bearing as shown below.



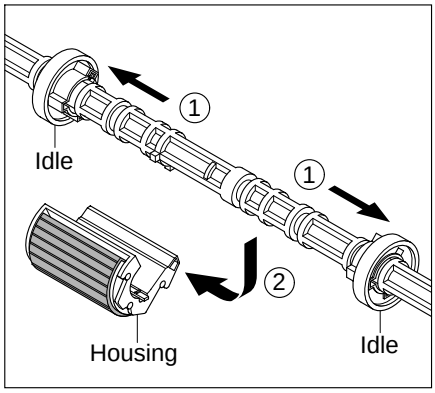
5. Slide the cam to the left by pulling on the MP Pick-up shaft



6. First lift the left side of the Shaft and then remove the Shaft.



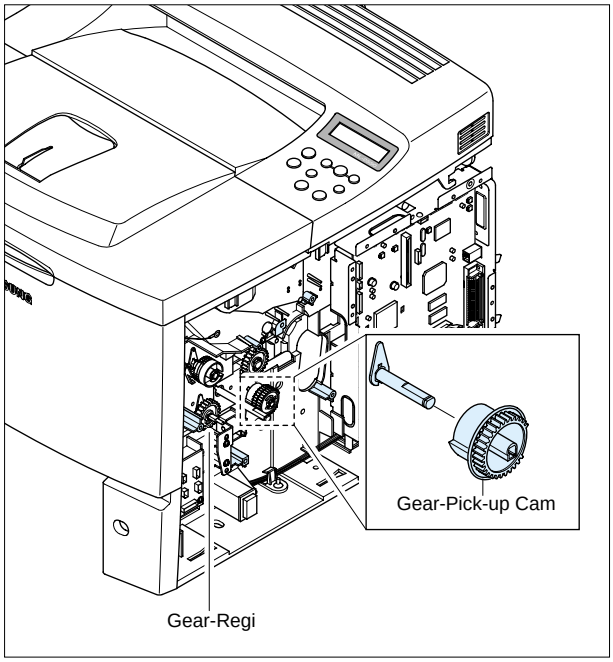
7. Push the idles toward the ends of shaft then take out the Housing as shown below.



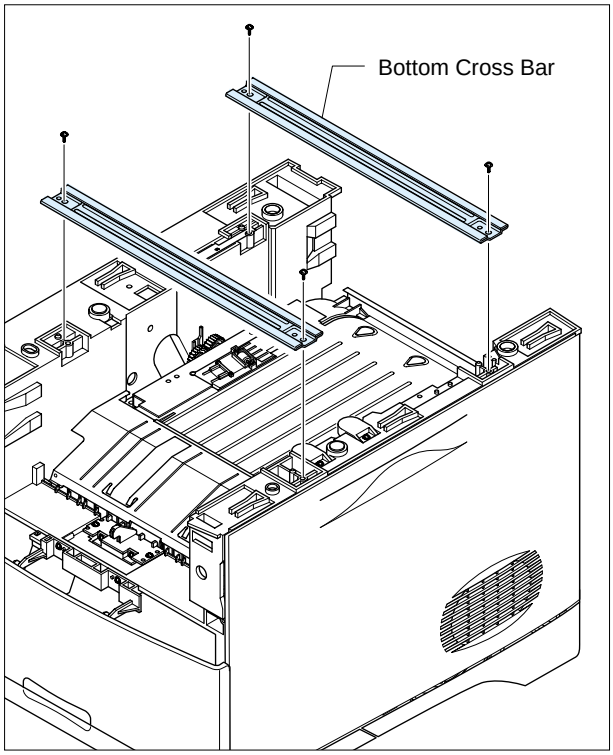
5.23 Pick-up Ass'y

1. Before you remove the Pick-up Unit, you should remove:
   - Cover-Right (Refer to the 5.5)
   - Main Drive Ass'y (Refer to the 5.7)

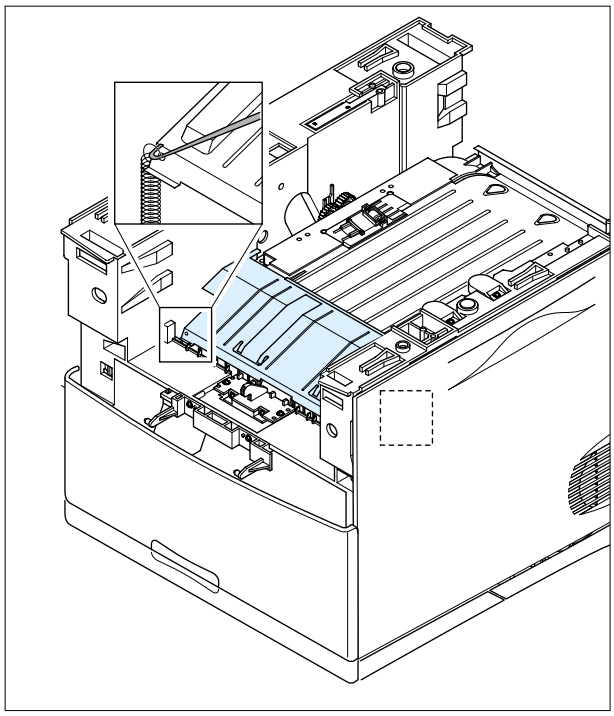
2. Remove E-Ring and take The Gear-Pick-up Cam out. Take the Gear-Regi out.



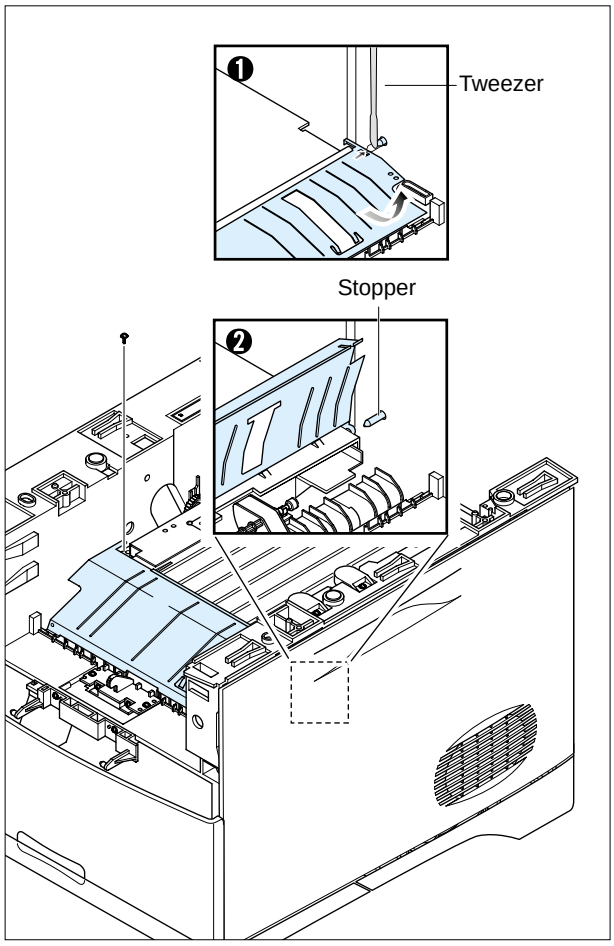
3. Remove four screws. Then lift the Bottom Cross Bar, as shown below.



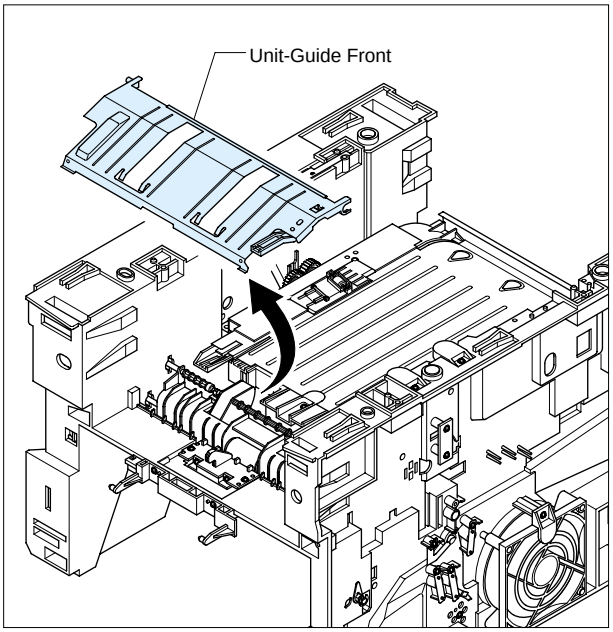
4. Remove two springs from the Pick-up Ass'y.



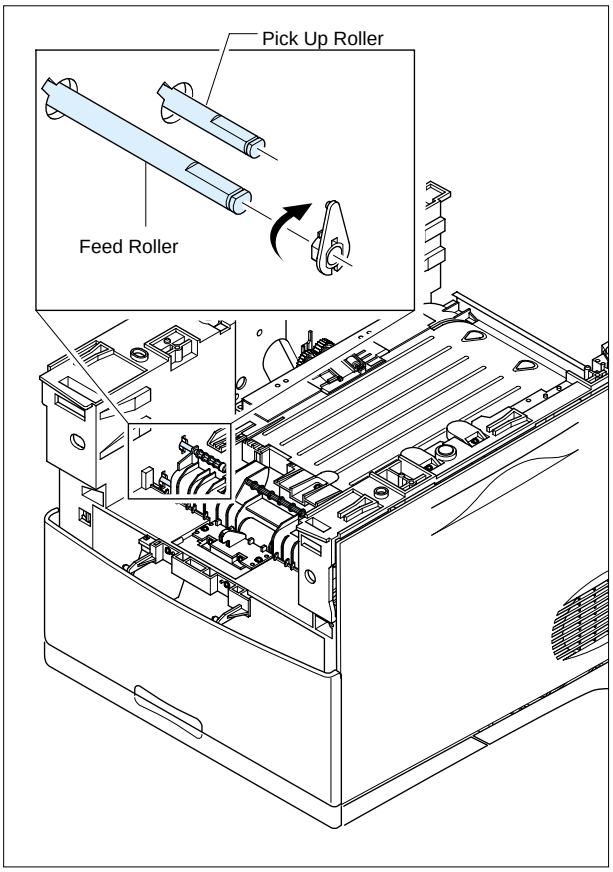
5. Lift Guide-Front-Dup out in the direction of arrow as shown below.



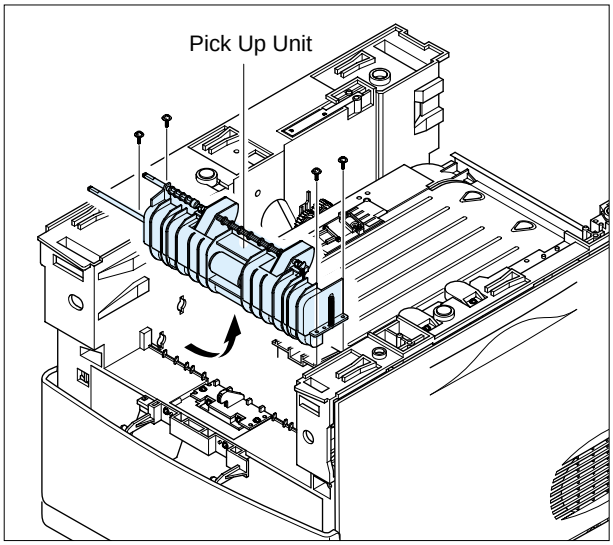
6. Lift Unit-Guide Front out in the direction of arrow as shown below.



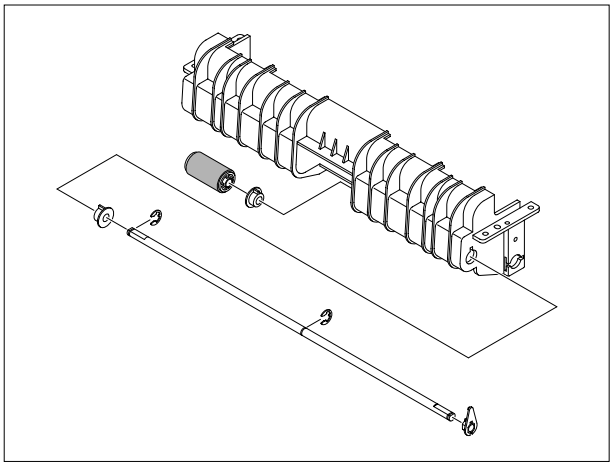
7. Remove the locking equipment rotate the Feed Roller Shaft's in the direction of the arrow and slide the bearing off as shown below.



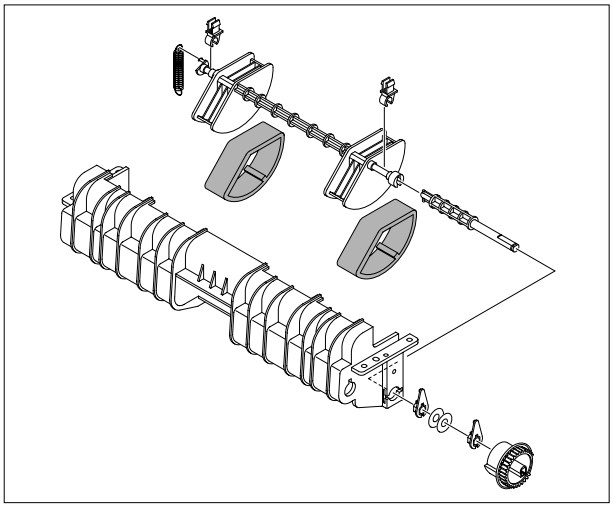
8. Remove four screws and lift the Pick-up Unit out in the direction of the arrow as shown below.



9. Remove the Feed Ass'y as shown below.



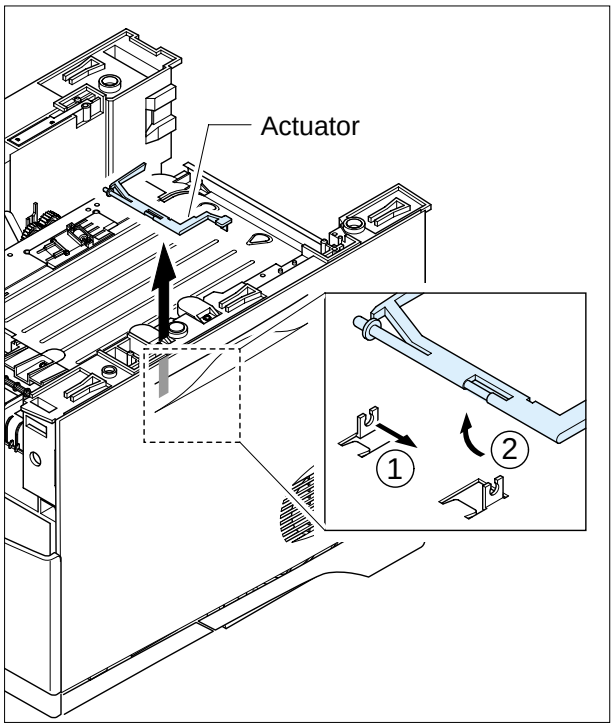
10. Remove the Pick-up Ass'y as shown below.



5.24 Engine Shield

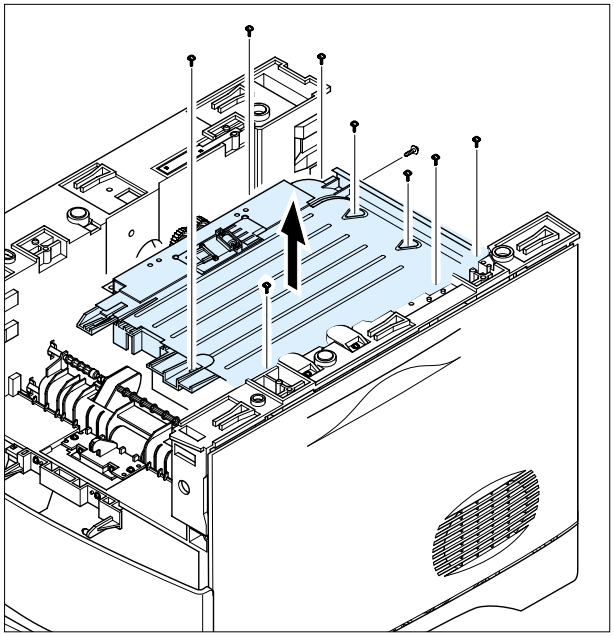
1. Remove the Guide-Front-Dup.(Refer to the 5.23.5)

2. Remove the Actuator as shown below.

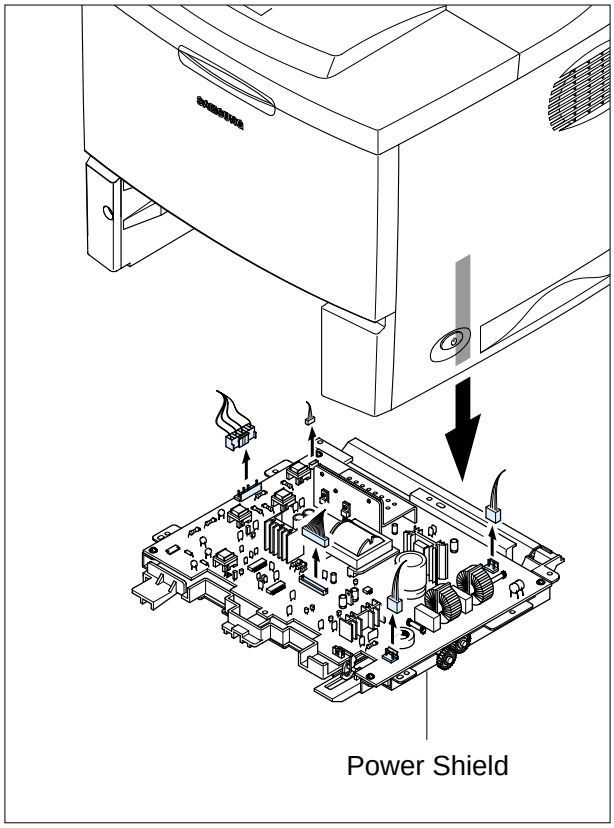


⚠ *Notice: Be careful not to get burnt when separating an Engine PBA.*

3. Remove nine screws and slightly lift the Engine Shield, as shown below.



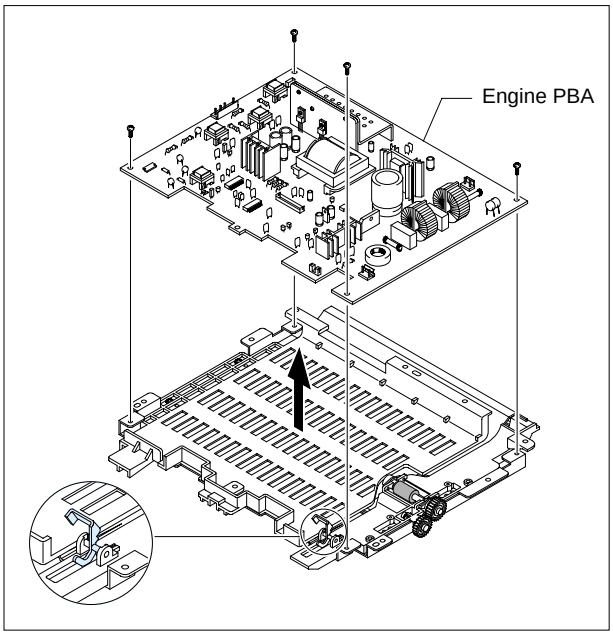
4. Unplug all of the connectors from the Engine PBA. Then take out the Engine Shield Ass'y.



5.25 Engine PBA

1. Before you remove the Engine Shield, you should remove:
   - Engine Shield (Refer to the 5.25)

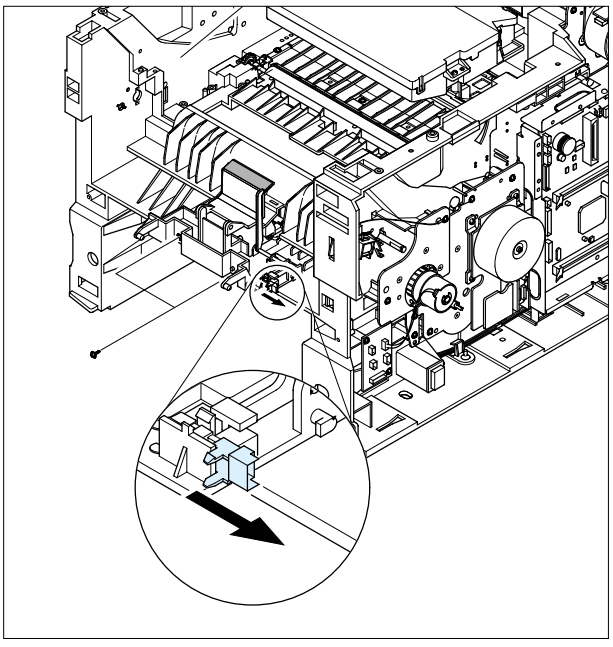
2. Remove four screws and take the Engine Board out of the Duplex Unit.



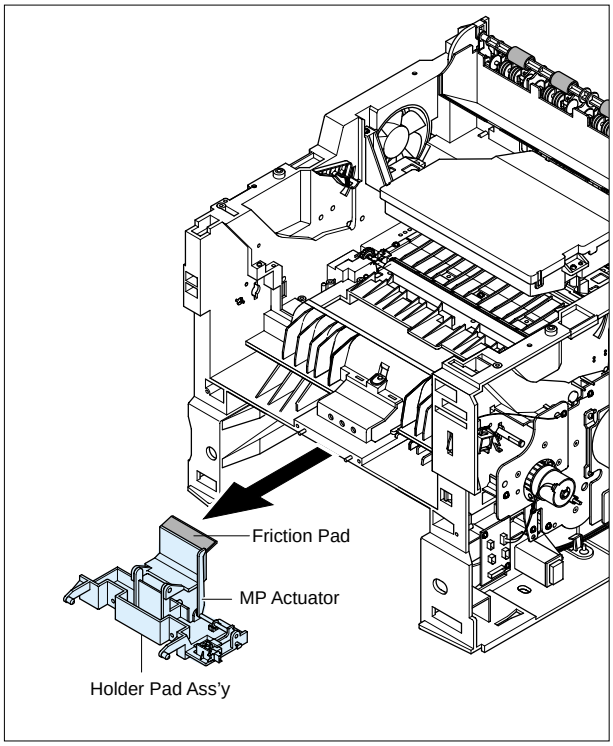
5.26 Holder Pad Ass'y

1. Before you remove the Holder Pad Ass'y, you should remove:
   - Unit-Guide Front(Refer to the 5.23.6)

2. Unplug the connector and remove the two screws, as shown below.



3. Remove the photo interrupter and the MP Actuator as shown below.



Memo

SAMSUNG

6. Alignment and Adjustments

This chapter describes the main functions for service, such as the product maintenance method, the test output related to maintenance and repair, DCU using method, Jam removing method, and so on. It includes the contents of manual.

6.1 How to use EDC (Engine Diagnostic Control) Mode

6.1.1 EDC Setup

- EDC(Engine Diagnostic Control, EDC will be used below) is considered to test and check whether each functions of machinery and h/w module are normal or not. All of the test function are able to be controlled by the keys and LCD window on the panel without any other kits.
- It's developed for related engineers, not for users.

6.1.2 Entering/Exiting Method For EDC

<1> Outline

- In order to enter the "EDC" mode, the entering method should be special because this mode is developed for related engineers, not for end users.
- Entering the mode, the message, "Diagnostic Mode(Top Line)/ Press Menu Key(Bottom Line)" is displayed.
- In this mode, an engineer should press the "Menu Key" to search each function he would like to test.

<2> Usage

1. Check printer is powered off.
2. Pressing the "Enter Key", power the printer on.
3. Continue to press the button until the message, "Diagnostic Mode" / "Press Menu Key" is displayed.
4. Press the "Menu Key".
5. Follow a usage for a function you would like to use.

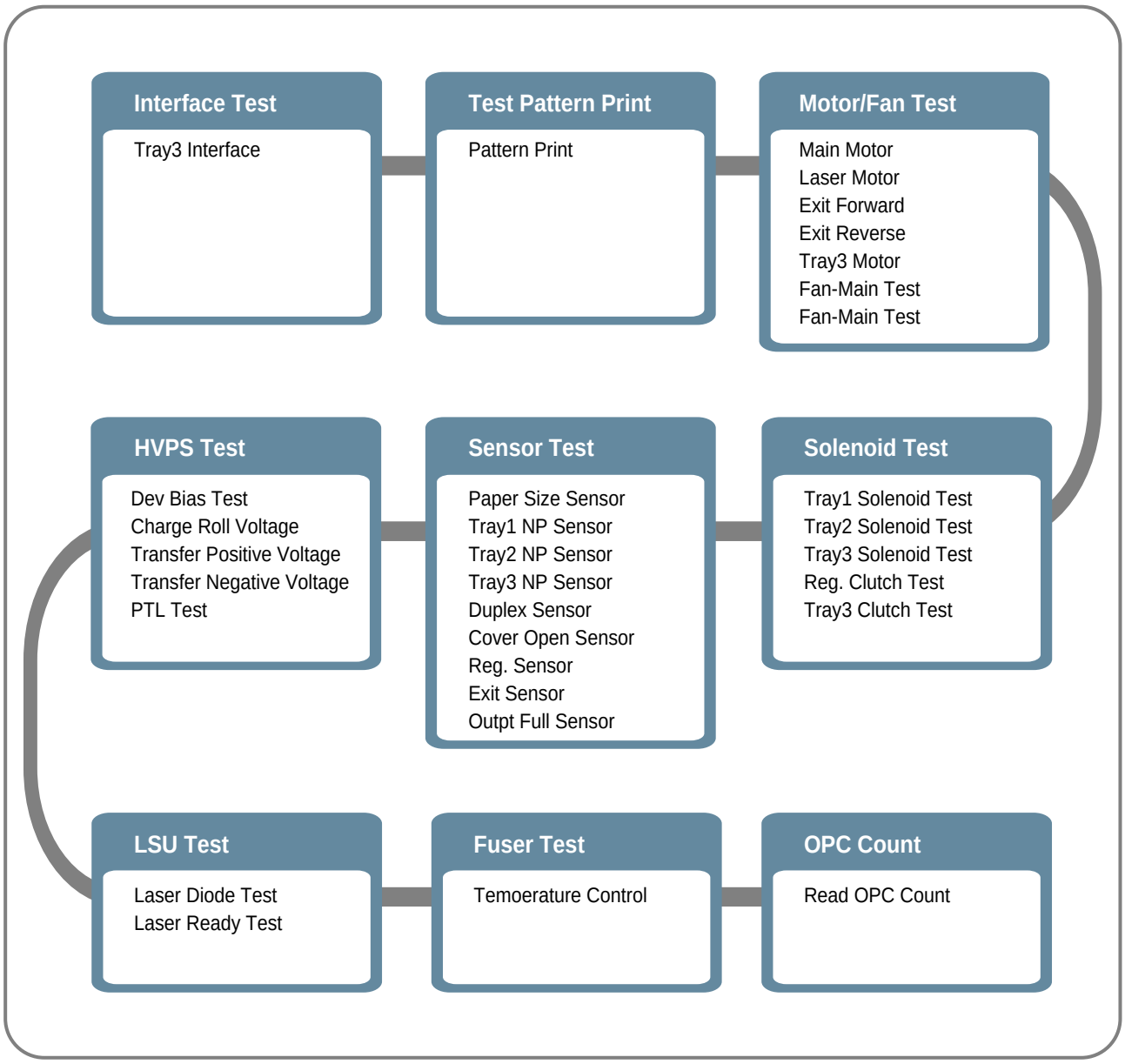
6.1.3 Usage & Function of Key on OPE

Key	Function	Description	Remarks
Menu	Menu	To enter the main Menu	
Arrow (right)	Search a Menu/ Input Data	To search a Menu and input a data	
Arrow (left)	Search a Menu/ Input Data	To search a Menu and input a data	
Select	Execute / Enter	To execute a function	
Cancel	Stop / Cancel	To stop a function	
Upper Level	Move	To move to the upper level	

6.1.4 Usage & Function of LCD

Line	Characters	Description	Remarks
Top	16	Upper Line messages mainly make users recognizing current test directory. [Main Menu] or [Function] is displayed.	
Bottom	16	Lower Line messages mainly make users recognizing current test location and status.	

6.1.2 How to use EDC (Engine Diagnostic Control) Mode



6.1.2.1 Interface Test (Main controller and Tray3 controller)

- This Function is used to check the communication state between the main controller and the tray 3 controller.

1. Press the "Menu Key", until finding "Interface Test" message on the panel.
2. Press the "Select Key", when it's found.

Sub Menu	Description	Display (LCD)
Tray3 Interface	After it is in the correct mode, a message is displayed on the panel. If the I/F is normal, “Pass” message will be displayed and abnormal, “Fail” displayed.	Tray 3 I/F : PASS(FAIL)

6.1.2.2 Test Pattern and Paper path

1. Press the “Arrow Keys(◀/▶)” until finding “[Main Menu]/ Test Pattern” message on the panel.
2. Press the “ENTER Key”, when it is found.
3. Confirming the “[Function]/ Test Pattern” message, press the ‘ENTER key’.
4. Fill a Tray with papers. (Auto tray)
5. Select simplex or duplex with arrow keys. (Default: Simplex)
6. Press the “ENTER Key”.
7. Input a number that will be printed with arrow keys.(Default: 1 page, Range: 1 - 999)
8. Press the “ENTER Key”, if you would like to print it.

Sub Menu	Description	Display (LCD)	Remark
Test Pattern Print	Pressing the “Enter Key”, the test pattern is printed. The location order below should be checked for a normal printing routine while it’s operating.	Pattern Print (Location)	Example -> Pattern Print : Exit On

Location order (It could be flexible with paper size):

(a) Simplex

(1) 1 Page: Laser Start → Pick up → Feed Sensor On → Exit Sensor On → End

(2) More than 1 Page: Laser Start → Pick up → Feed Sensor On → Pick up → Feed Sensor On → … → Exit Sensor On → End

(b) Duplex

(1) 1 Page: Laser Start → Pick up → Feed Sensor On → Exit Sensor On → Duplex Sensor On → Feed Sensor On → Exit Sensor On → End

(2) More than 1 Page: Laser Start → Pick up → Feed Sensor On → Exit Sensor On → Duplex Sensor On → Feed Sensor On → Pick up → Feed Sensor On → … → Exit Sensor On → End

6.1.2.3 Motor & Fan Test

- These Functions are used to check the present state (normal or not) of the motors and fan.

1. Press the "Menu Key", until finding "Motor/Fan Test" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding the desired function
   (Refer to the table below).
4. Press the "Select Key", when it's found.
5. Press the "Select Key" for execution or the "Cancel key" to stop.

Sub Menu		Description	Display(LCD)
Main Motor		The main motor keeps running after the execution key is chosen and stops when the stop key is chosen.	Main Motor Running Test (On/Off)
Laser Motor		The laser motor keeps running after the execution key is chosen and stops when the stop key is chosen.	Laser Motor Running Test (On/Off)
Exit Motor	Exit Forward	The exit motor keeps running on the forward direction after the execution key is chosen and stops when the stop key is chosen.	Exit Forward Running Test (On / Off)
	Exit Reverse	The exit motor keeps running on the backward direction after the execution key is chosen and stops when the stop key is chosen.	Exit Reverse Running Test (On / Off)
Tray 3 Motor		The Tray3 motor keeps running after the execution key is chosen and stops when the stop key is chosen. --> When a tray 3 is not installed, this function is not processed and "Tray 3 Not Installed" is shown.	Tray 3 Motor Running Test (On / Off)
Fan-Main		The fan keeps running after the execution key is chosen and stops when the stop key is chosen.	Fan-Main(On / Off)
Fan-Sub		The sub-fan function processes just like the fan-main function.	Fan-Sub(On / Off)

6.1.2.4 Solenoid & Clutch Test

- These Functions are used to check the present state (normal or not) of the solenoids and clutches.

1. Press the "Menu Key", until finding "Solenoid Clatch" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding the desired function.
   (Refer to the table below)
4. Press the "Cancel Key", when it's found.
5. Press the "Select Key" for execution

Sub Menu	Description	Display(LCD)
Tray 1 Solenoid	The tray1 solenoid is on for 200ms and then it automatically stops, when the execution is chosen.	Tray 1 Solenoid On/Off
Tray 2 Solenoid	The tray2 solenoid is on for 200ms and then it automatically stops, when the execution is chosen.	Tray 2 Solenoid On/Off
Tray 3 Solenoid	The tray3 solenoid is on for 200ms and then it automatically stops, when the execution is chosen.	Tray 3 Solenoid On/Off
Reg. Clutch	The tray2 clutch is on for 1sec and then it automatically stops, when the execution is chosen. In this function, the clutch will be on after the main motor runs in order to check the clutch state.	Reg. Clutch On/Off
Tray 3 Clutch	The tray3 clutch is on for 1sec and then it automatically stops, when the execution is chosen. In this function, the clutch will be on after the tray 3 motor runs in order to check the clutch state. --> When a tray 3 is not installed, this function is not processed and “Tray 3 Not installed” is shown.	Tray 3 Clutch On/Of

6.1.2.5 Sensor Test

1)Paper Size Sensor

1. Press the “Arrow Keys(◀ / ▶)” until finding “[Main Menu]/ Sensor” message on the panel.
2. Press the “ENTER Key”, when it is found.
3. Press the “Arrow keys” until finding “[Function]/ PaperSize Sensor”.
4. Press the “ENTER Key”, when it is found.
5. Pull out a tray (2 or 3, not 1) you would like to test.
6. Check the message, “Tray 2: Out(Tray 3: Empty/Out)” is displayed.
7. Fill the tray with one or more papers.
8. Put the tray back.
9. Check the message on the LCD window. (The top line for tray2 and the bottom line for tray3)
10. Compare the paper message on the window with the real paper size.

Sub Menu	Description	Example		Remarks
		Message	Real Paper	
Paper Size Sensor	After a tray is filled with papers, confirm the paper size and compare it with the real size.	Tray2: Letter Tray3: Empty/Out	Letter Empty	

* Display messages list
  - Tray 2: Letter, Legal, A4, Exec, B5, Folio, A5, Open, Empty
  - Tray 3: Letter, Legal, A4, Exec, B5, Folio, A5, Empty/Out, N/Install

2)The Other Sensors

1. Press the “Arrow Keys(◀ / ▶)” until finding “[Main Menu]/ Sensor” message on the panel.
2. Press the “ENTER Key”, when it is found.
3. Press the “Arrow keys” until finding a suitable function.(Refer to the table below)
4. Press the “ENTER Key”, when it is found.
5. Touch a sensor you would like to test.
6. Check the message on the LCD window for the state of it.

Sub Menu	Description	Display(LCD)		Remarks
		Befor touching	After touching	
Tray 1 No Paper Sensor	After the tray 1 is pulled out, touch the sensor and confirm the message changed.	Tray 1 W/Out Paper	Tray 1 With Paper	
Tray 2 No Paper Sensor	After the tray 2 is pulled out, touch the sensor and confirm the message changed.	Tray 2 W/Out Paper	Tray 2 With Paper	
Tray 3 No Paper Sensor	After the tray 3 is pulled out, touch the sensor and confirm the message changed.	Tray 3 W/Out Paper	Tray 3 With Paper	
Duplex Sensor	After the back cover is opened, push a paper into the duplex path and confirm the message changed.	Duplex Sensor W/Out Paper	Duplex Sensor With Paper	
Cover Open Sensor	After the cover is open, touch the sensor and confirm the message changed.	Cover Open	Cover Open	
Reg Sensor	After the cover is open and the toner cartridge is out, touch the sensor and confirm the message changed.	Reg. Sensor W/Out Paper	Reg. Sensor With Paper	
Exit Sensor	After the back cover is open, push a paper into the exit path and confirm the message changed.	Exit Sensor W/Out Paper	Exit Sensor With Paper	
Output Full	Touch the sensor in the output Bin and confirm the message changed.	Output Not Full	Output Full	

6.1.2.6 HVPS Test Item : High Voltage Power Supply

- These Functions are used to check whether the control for HVPS is normal or not.

1. Press the "Menu Key", until finding "HVPS" is displayed on the panel.
2. Press the "Select Key", when it's found.
3. Press the "Arrow keys" (< / >), until finding a suitable function (Refer to the table below).
4. Press the "Select Key", when it's found.
5. Press the "Select Key" for execution or the "Cancel key" for stop.

Sub Menu	Description	Display (LCD)	Remarks
Dev Bias	Dev bias (-470V) is supplied after the execution key is chosen and stops when the stop key is chosen.	Dev Bias (On/Off)	
Charge Roll Voltage	Charge roller voltage (-1500V) is supplied after the execution key is chosen and stops when the stop key is chosen.	Charge Roll (On/Off)	ADC value displayed
Transfer Roll(+)	Transfer positive voltage (+1000V) is supplied after the execution key is chosen and stops when the stop key is chosen.	Transfer Roll(+) (On/Off)	ADC value displayed
Transfer Roll(-)	Transfer negative voltage (-850V) is supplied after the execution key is chosen and stops when the stop key is chosen.	Transfer Roll(-) (On/Off)	
PreTransfer Lamp	The Pre-Transfer Lamp is on after the execution key is chosen and stops when the stop key is chosen. It is possible to confirm the lamp is on after the cover is opened and the cartridge is removed.	PreTransfer Lamp (On/Off)	

* The bias measurements need extra actions for confirmation and further information, excepting the pre-transfer lamp test.
(Refer to 6.1.3 Checking normality of supplying high voltage)

6.1.2.7 Laser Scanning Unit

<1> Outline

• These functions are to check a current state (normal or not) of the Laser Scanning Unit.

<2> Usage

1. Press the “Arrow Keys(◀ / ▶)” until finding “[Main Menu]/ Laser Scanning” message on the panel.
2. Press the “ENTER Key”, when it is found.
3. Press the “arrow keys” until finding a suitable function. (Refer to the table below)
4. Press the “ENTER Key”, when it is found.
5. Press the “ENTER Key” for execution or the “Cancel key” for stop.

<3> Function

Function Name	Description	Display (LCD)	Remarks
Laser Diode	“Laser Diode On” is displayed, when the laser diode is on. On the other case “Laser Diode Off” is displayed.	Laser Diode (On/Off)	
Laser Ready	When Laser Scanning Unit is ready to print (Laser diode on, Stable polygon motor speed) the message, “Laser Ready” is displayed. On the other case “Laser Error”	Laser Ready (Error)	

6.1.2.8 Fuser

<1> Outline

• This function is to check a current state (normal or not) of the fuser.

<2> Usage

1. Press the “Arrow Keys(◀ / ▶)” until finding “[Main Menu]/ Fuser” message on the panel.
2. Press the “ENTER Key”, when it is found.
3. Confirm the message, “[Function]/ Fuser Control”.
4. Press the “ENTER Key”.
5. Set the temperature with arrow keys. (Default: 150 °C, Range: 100 -190°C)
6. Compare a target temperature with a real temperature.

<3> Function

Function Name	Description	Display (LCD)	Remarks
Temperature Control	When “Target Temp” is displayed, Input a temperature you would like to set with the “arrow keys (◀ / ▶)” and Press the “Enter key”. The target temperature and a real temperature will be displayed on the bottom line. It is possible to confirm a current software fuser control state with signs ([O] for fuser-on, [X] for fuser-off)	Target : XX Current: XX [O]	

6.1.2.9 OPC Count

<1> Outline

• This function is to check a total rotating number of OPC drum as of the entering point.

<2> Usage

1. Press the “Arrow Keys(◀ / ▶)” until finding “[Main Menu]/ OPC Count” message on the panel.
2. Press the “ENTER Key”, when it is found.
3. Confirming the “[Function]/ Read OPC Count” message, press the ‘ENTER key’.

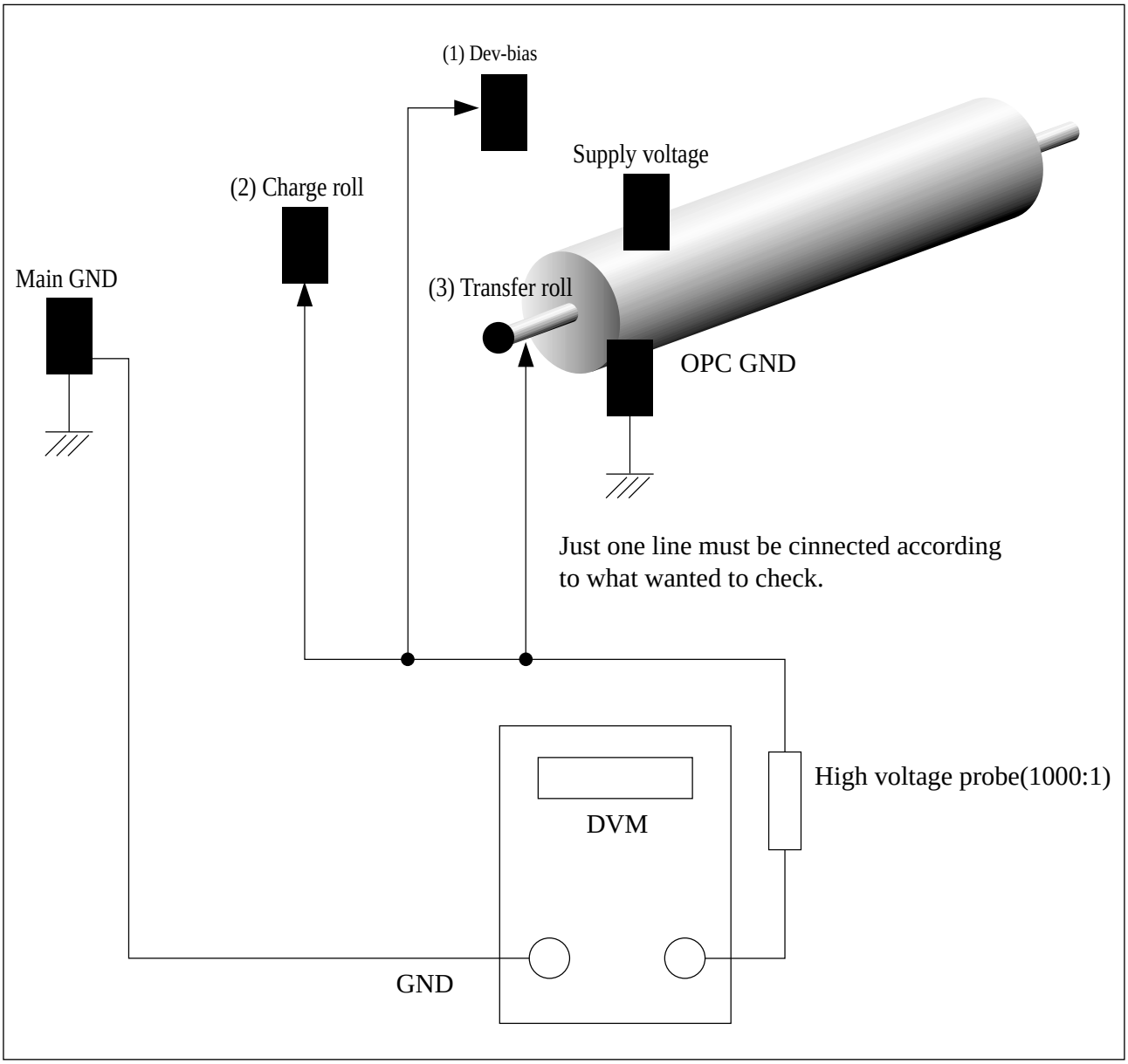
<3> Function

Function Name	Description	Display (LCD)	Remarks
Read OPC Count	A total rotating number of OPC drum is displayed on the bottom line of LCD window, when the process is on.	Total OPC-Count XXXX	

6.1.3 Checking normality of supplying high voltage

6.1.3.1 Dev-bias

- Prepare measurement equipments à a Digital Voltage Multi-meter (DVM) and a high voltage probe.
- Open (disjoint) the left-cover of a set.
- Make sure the places of iron plates.
- Connect equipments like the number (1) of figure 1-1.
- Make the set supplying dev-bias by following the usage of the section 6.1.2.6
- Confirm that the DVM shows a value in -450V ~ -490V
  (value on the DVM screen: -0.45 ~ -0.49).



[Figure 1-1 Checking method for supplying high voltage]

6.1.3.2 Charge roll voltage

- Prepare measurement equipments à a Digital Voltage Multi-meter (DVM) and a high voltage probe.
- Open (disjoint) the left-cover of a set.
- Make sure the places of iron plates.
- Connect equipments like the number (2) of figure 1-1.
- Make the set supplying charge roll voltage by following the usage of the section 6.1.2.6
- Confirm that the DVM shows a value in -1450V~ -1550V
  (value on the DVM screen: -1.45 ~ -1.55).

6.1.3.3 Transfer roll(+) voltage

- Prepare measurement equipments à a Digital Voltage Multi-meter (DVM) and a high voltage probe.
- Open (disjoint) the left-cover of a set.
- Open the top-cover and pull out the cartridge in the set.
- Press the cover open switch with paper or some other stuff.
  → Cause: Do not press with your hand..
- Connect the probe with the shaft like the number (3) of figure 1-1
- Make the set supplying transfer roll(+) voltage by following the usage of the section 6.1.2.6
- Confirm that the DVM shows a value in +980V~ +1020V
  (value on the DVM screen: +0.98 ~ +1.02).

6.1.3.4 Transfer roll(-) voltage

- Prepare measurement equipments à a Digital Voltage Multi-meter (DVM) and a high voltage probe.
- Open (disjoint) the left-cover of a set.
- Open the top cover and pull out the cartridge in the set.
- Press the cover open switch with paper or some other stuff.
  → Cause: Do not press with your hand..
- Connect the probe with the shaft like the number (3) of figure 1-1
- Make the set supplying transfer roll(-) voltage by following the usage of the section 6.1.2.6
- Confirm that the DVM shows a value in -500V~ -950V
  (value on the DVM screen: -0.50 ~ -0.95)

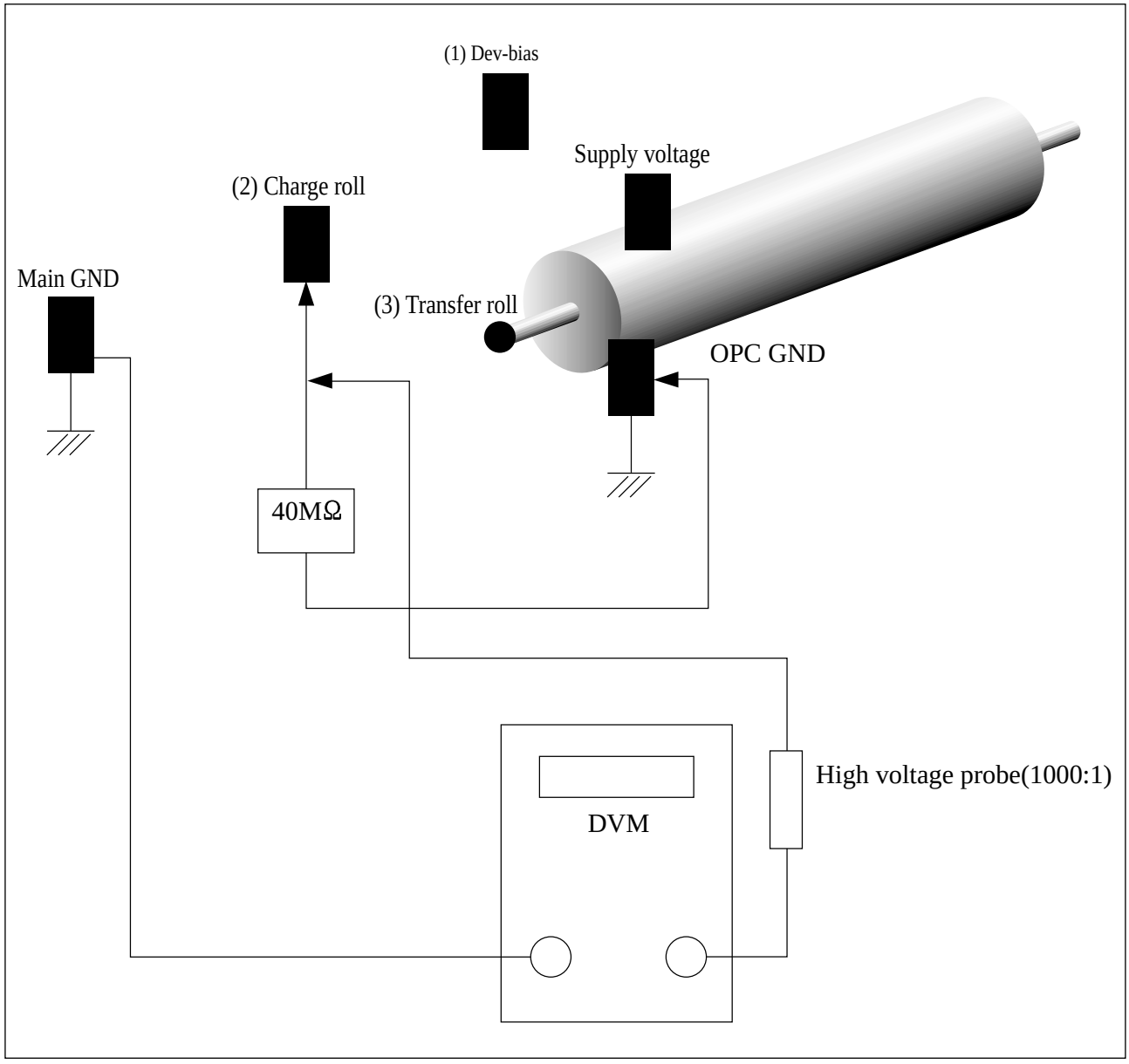
6.1.4 Checking normality of modules for environmental recognition process

6.1.4.1 Outline

- Transfer(+) roll voltage and charge roll voltage are related to the environmental recognition process. Therefore, these functions (Transfer roll(+), Charge roll) in EDC should be supported to check that printer sets are sufficient to recognize a right environmental circumstance.
- After executing a function of them, an ADC (analog to digital converter) value will be displayed. The value is the standard of checking the normality.

6.1.4.2 Checking method – Charge roll voltage

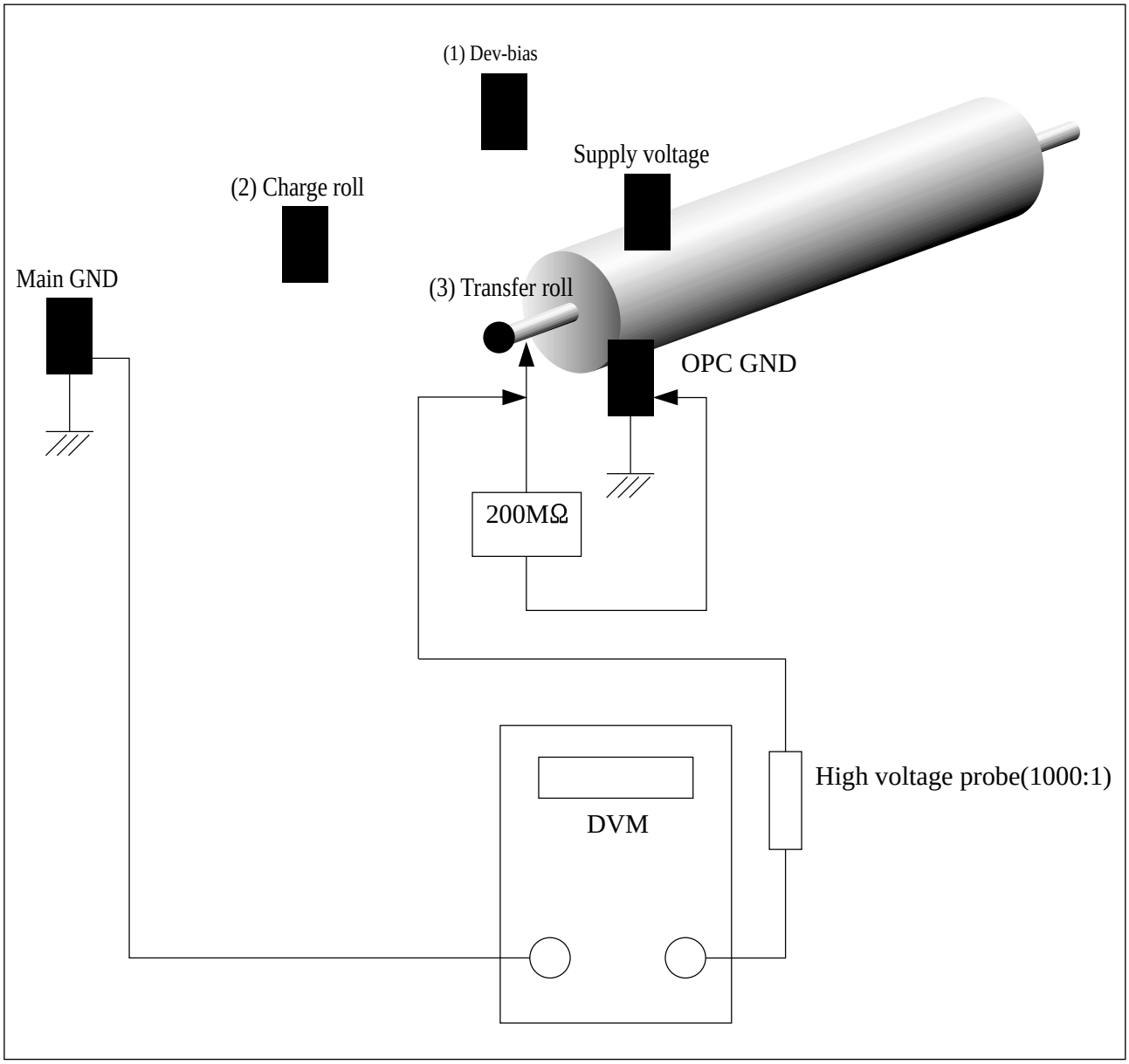
- Open the top-cover in a set
- Pull out the cartridge in the set.
- Press the cover open switch with paper or some other stuff.
  → Cause: Do not press with your hand.
- Prepare measurement equipments
  → a Digital Voltage Multi-meter (DVM), a high voltage probe and a 40M˜ resistor.
- Open (disjoint) the left-cover.
- Make sure the places of iron plates.
- Connect equipments like the figure 1-2.
- Make the set supplying charge roll voltage by following the usage of the section 6.1.2.6
- Confirm that a display value on the panel of the set is in 225~245.



[Figure 1-2 Checking method for environmental recognition process – Charge roll]

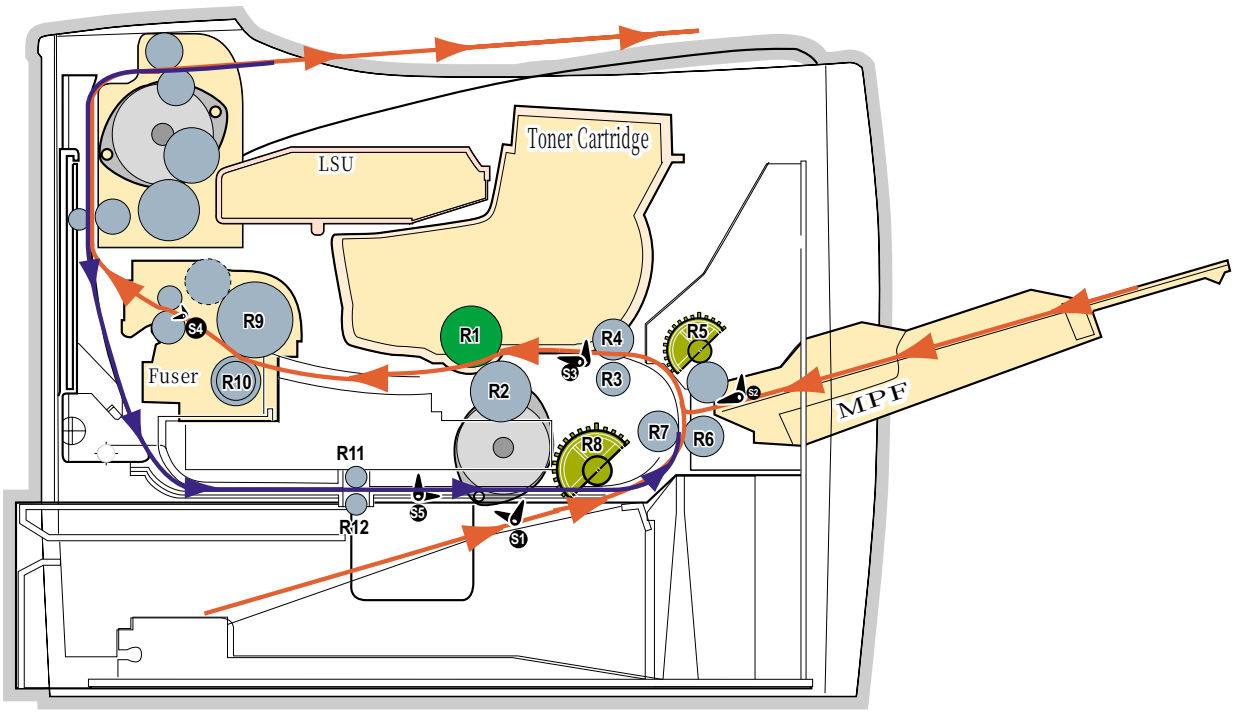
6.1.4.3 Checking method – Transfer roll(+) voltage

- Open the top-cover in a set
- Pull out the cartridge in the set.
- Press the cover open switch with paper or some other stuff.
  → Cause: Do not press with your hand.
- Prepare measurement equipments
  → a Digital Voltage Multi-meter (DVM), a high voltage probe and a 200M˜ resistor.
- Connect the probe with the shaft like the figure 1-3.
- Make a set supplying transfer roll(+) voltage by following the usage of the section 6.1.2.6
- Confirm that a display value on the panel of the set is in 105~125.

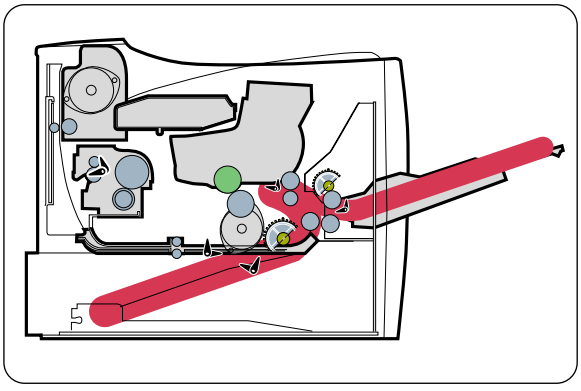


[Figure 1-3 Checking method for environmental recognition process – Transfer roll(+)]

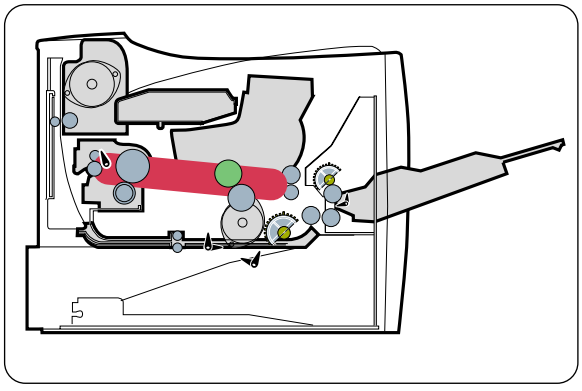
6.2 Paper Path



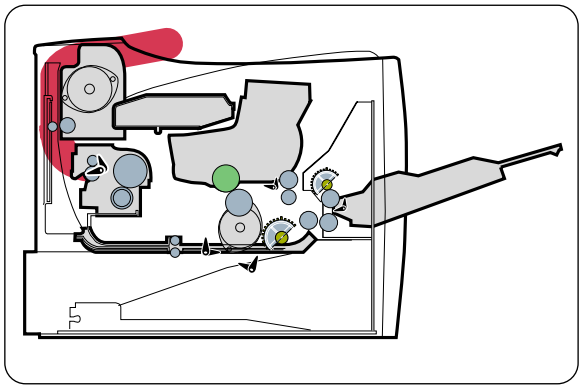
R1 : OPC Drum	R7 : Feed Roller	S1: Paper Empty(Cassette) Sensor
R2 : Transfer Roller	R8 : Pick-UP Roller	S2: Paper Empty(MPF) Sensor
R3 : Regi Roller	R9 : Heat Roller	S3: Regi Sensor
R4 : Idle Roller	R10 : Pressure Roller	S4: Exit Sensor
R5 : MP Pick-UP Roller	R11 : Duplex Roller	S5: Duplex Sensor
R6 : Retard Roller	R12 : Duplex Idle Roller	



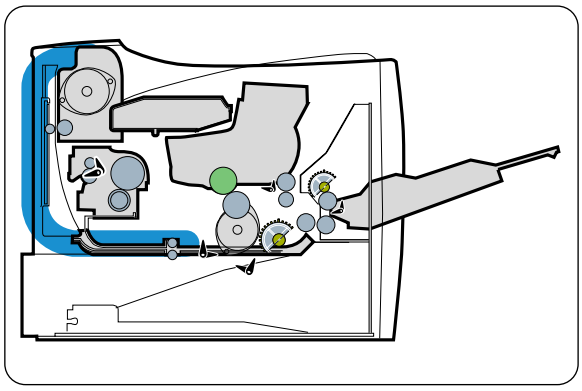
<Jam 0>



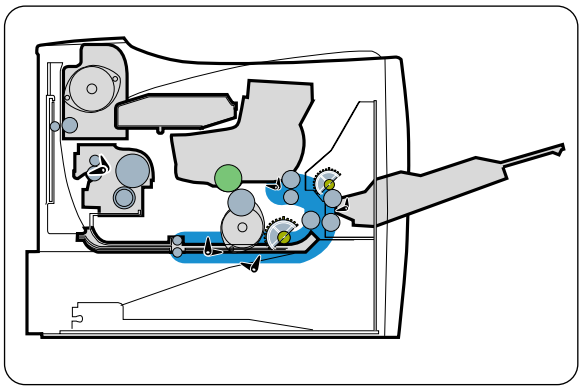
<Jam 1>



<Jam 2>



<Jam Duplex 1>



<Jam Duplex 2>

• Simplex

1) A paper is fed from a cassette or MPF by a printing order.
2) The fed paper passes a paper feeding sensor.
   - If the sensor does not operate after feeding the paper, the Jam0 occurs.
3) The paper passes a paper exit sensor, and it comes out from a machine.
   - If the tailing edge of the paper does not come out from a machine after the leading edge of the paper passes the sensor, then certain time later, a Jam2 occurs.

• Duplex

1) A paper is fad from a cassette or MPF by a printing order.
2) The fed paper passes a paper feeding sensor.
   - If the sensor does not operate after feeding the paper, a Jam0 occurs.
3) The paper that passes a paper exit sensor takes several printing processes, and moves to a paper exit sensor.
   - If the sensor does not operate after certain time, a Jam 1 occurs.
4) If the paper does not discharge until the paper passes an exit roller and a Roller-Exit-F/Down, a Jam 2 occurs.
5) The printing paper starts to be printed for duplex only by reversing rotation by an exit motor. The printing paper enters to a machine through an exit roller, and reaches to duplex sensor.
   - If the printing paper cannot reach to the duplex sensor after certain time, a duplex Jam 1 occurs.
6) The printing paper that passes the duplex sensor reaches to a feed sensor again and a printing operation is tried over again.
   - If the printing paper cannot reach to a feed sensor after certain time later, a duplex Jam 2 occurs.

6.2.1 Clearing Paper Jams

When a paper jam occurs,the display on the control panel shows the message indicating the corresponding location of the paper jam.

6.2.1.1 Tips for Avoiding Paper Jams

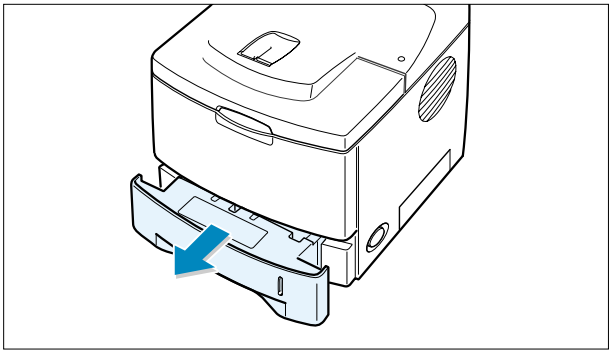
By selecting the correct paper types, most paper jams can be avoided. If a paper jam occurs, follow the steps outlined in

- Ensure that the adjustable guides are positioned correctly.
- Do not overload the tray. Ensure that the paper is below the paper capacity mark on the right inside of the tray.
- Do not remove the paper from the tray while printing.
- Flex, fan and straighten the paper before loading.
- Do not use creased, damp or highly curled paper.
- Do not mix paper types in the input tray.
- Use only recommended print media.
- Ensure that the recommended print side is facing down when loading paper into the input tray.

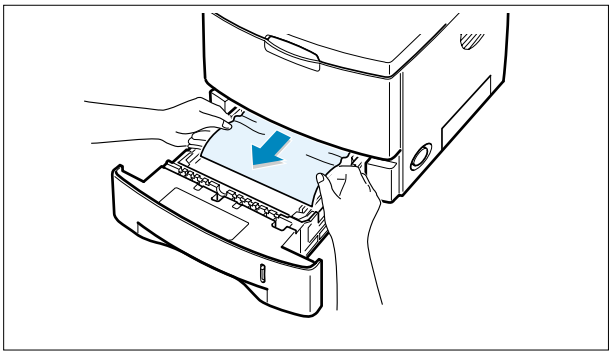
6.2.1.2 In the Paper Feed Area(Jam 0)

• In the Tray1

1. Slide out the Tray1 to expose the jammed paper.

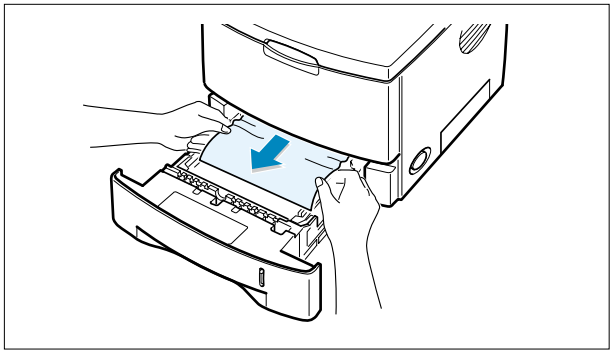


2. Remove any misfed paper by pulling it out by the visible edge from the tray.Make sure that all of the paper is properly aligned in the tray.



NOTE : If the jammed paper is not invisible or if there is resistance when you pull the paper,remove the tray from the printer and carefully pull the jammed paper free from the printer.

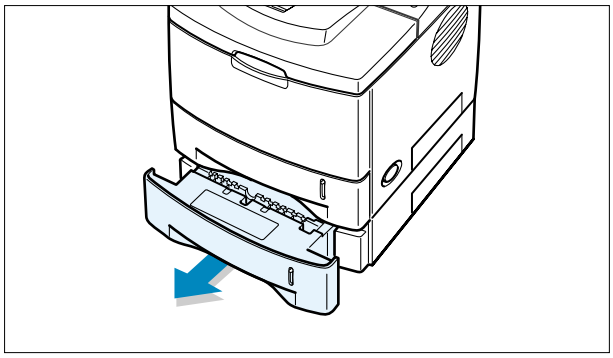
3. Slide the tray back into the printer.



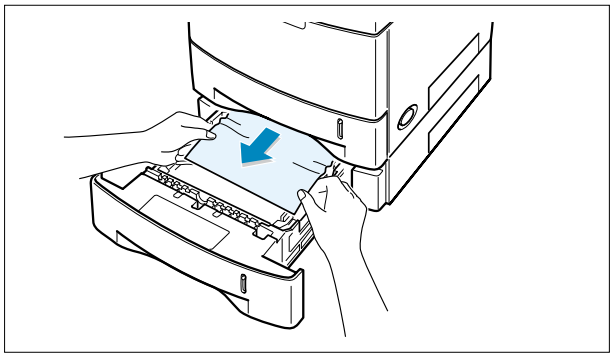
4. Open and close the top cover to resume printing.

• In the Optional Tray2

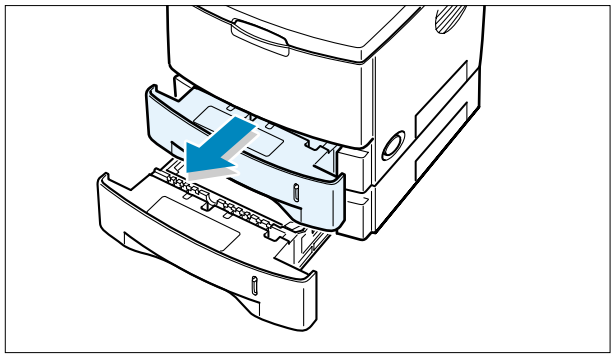
1. Pull the optional Tray2 out of the printer.



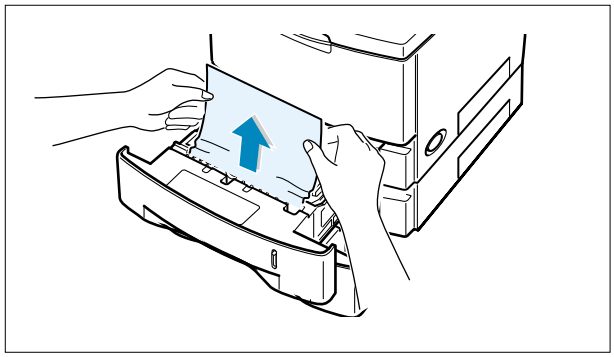
2. If you see the jammed paper,remove the paper from the tray.



3. If you cannot find the jammed paper in the Tray2,pull the Tray1 half way out of the printer,and remove the paper.



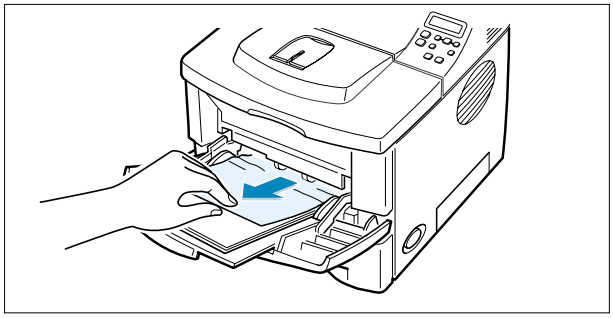
4. Slide the trays back into the printer. Open and close the top cover.Printing can be resumed.



• In the Multi-Purpose Tray

1. Open the Multi-Purpose Tray.

2. Carefully remove the jammed paper from the tray.



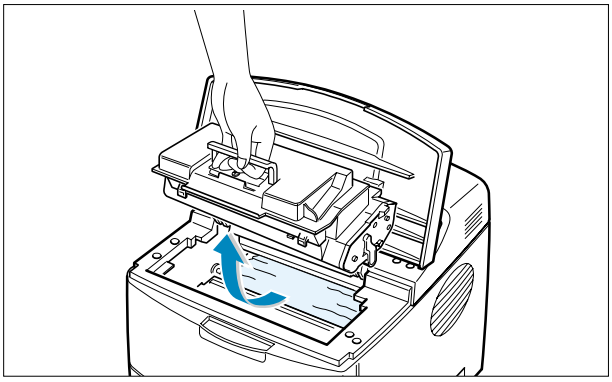
3. Open and close the top cover.Printing can be resumed.

6.2.1.3 Around the Toner Cartridge (Jam1)

1. Open and close the top cover,and the jammed paper should exit the printer.

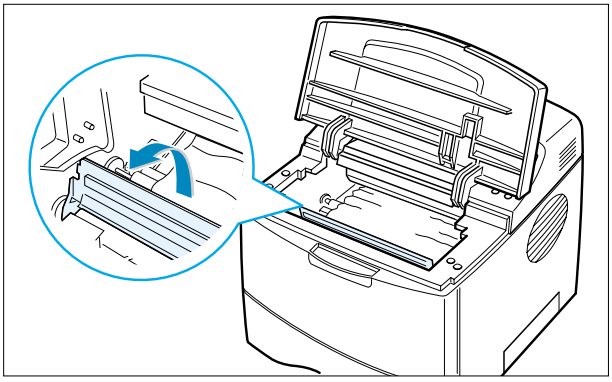
   If not,continue to Step 2.

2. Open the top cover and remove the toner cartridge.

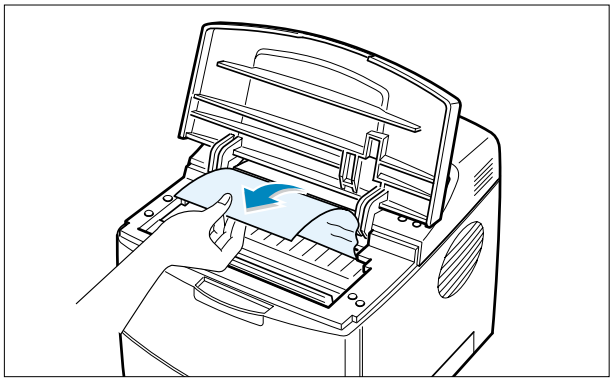


CAUTION : To prevent damage to the toner cartridge,do not expose it to light for more than a few minutes.Place a piece of paper over the top of the toner cartridge to shield it while it is out of the printer.

3. Carefully lift up the guide feed.

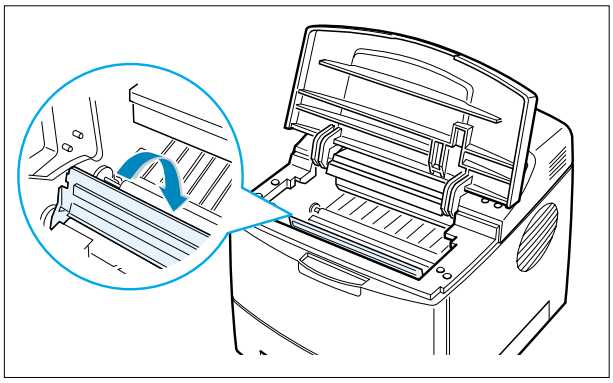


4. Gently pull the jammed paper towards you to remove it from the printer.



If the jammed paper is not visible or there is resistance when you pull the paper,go to “In the Paper Exit Area ”.

5. Flip down the guide feed and reinstall the toner cartridge.

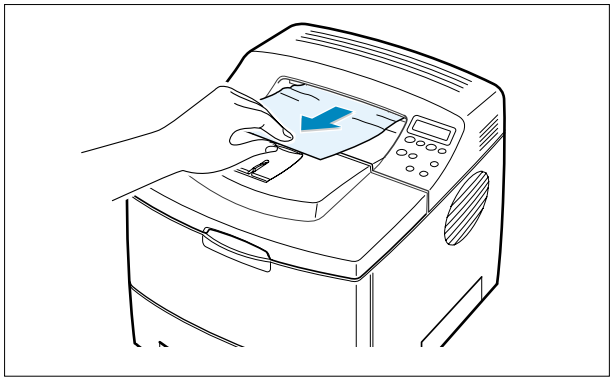


NOTE : If the toner cartridge is difficult to reinstall,make sure that the guide feed has been flipped back down into position.

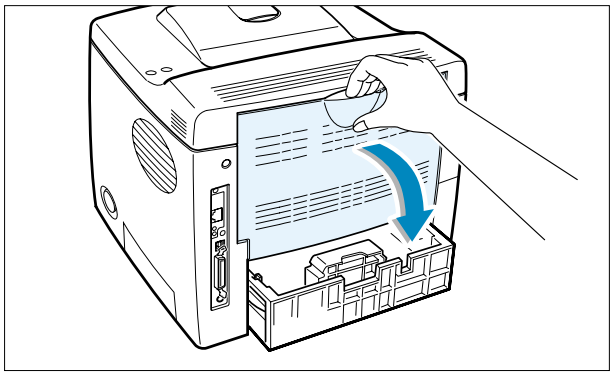
6. Close the top cover.Printing can be resumed.

6.2.1.4 In the Paper Exit Area (Jam 2)

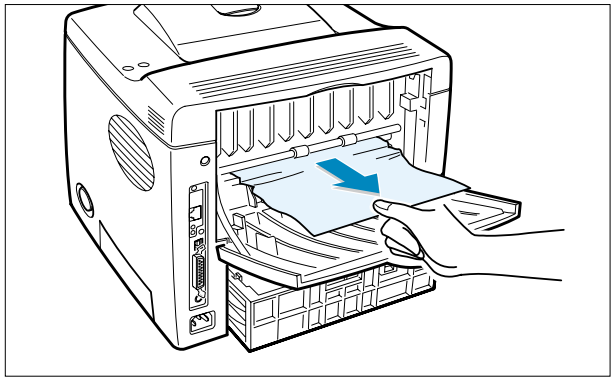
1. If a long portion of the paper is visible,pull it straight out. If not,continue to Step 2.



2. Open the rear output tray.



3. Loosen the paper if it is caught in the feed rollers. Then gently pull the paper out.



4. Close the rear output tray.

5 Open and close the top cover.Printing can be resumed.

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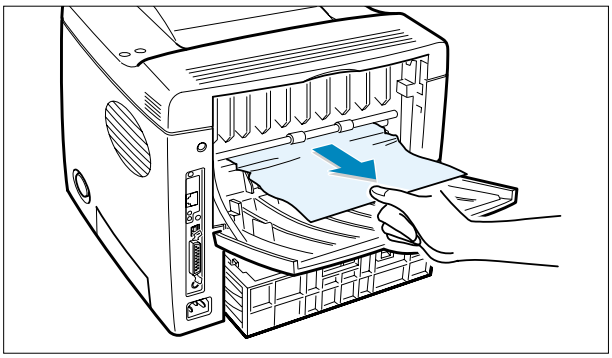
6.2.1.5 In the Duplex Area

• Duplex Jam 1

1. Open the rear output tray.

2. Remove the jammed paper.



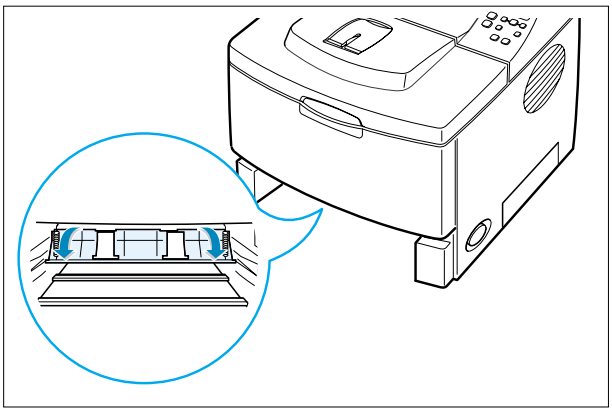
3. Close the rear output cover.

4. Open and close the top cover.Printing can be resumed.

• Duplex Jam 2

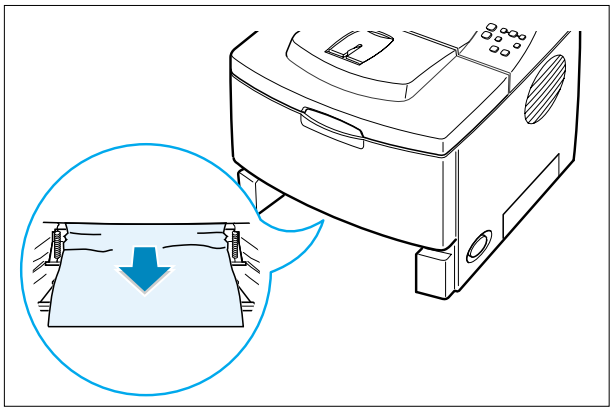
1. Pull the paper tray out of the printer.

2. Pull down the metal plate inside of the printer.



CAUTION : Pulling the plate could cause an injury.Use the lever on the left.

3. Remove the jammed paper.



4. Slide the tray back into the printer.

5. Open and close the top cover.Printing can be resumed.

6.3 Sample Pattern

This product has the several sample patterns for maintenance. With the sample patterns, check the existence of the abnormality. The patterns help to regularly maintain the product.

6.3.1 Printing a Demo Page

Print a demo page to make sure that the printer is operating correctly.

1. Press the **Menu** button ( ) on the control panel until you see “Information ” on the bottom line of the display..
2. Press the **Enter** button ( ) to access the Menu.
3. Press the scroll button (or) until you see “Demo Page ” on the bottom line.
4. Press the **Enter** button ( ) .

A demo page showing the printer ’s features and capabilities prints out.

6.3.2 Printing a cleaning sheet

If you are experiencing blurred,faded or smeared printouts,you can clear the problem by printing a cleaning sheet,provided by your printer.You can print:

• OPC Cleaning sheet:cleans the OPC drum of the toner cartridge.
• Fuser Cleaning sheet:cleans the fuser unit inside the printer.

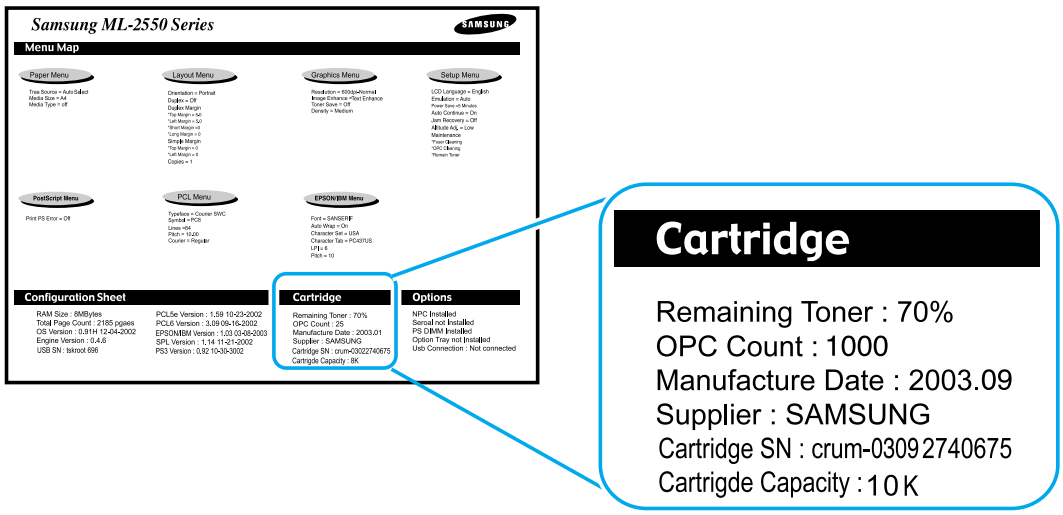
This process will produce a page with toner debris,which should be discarded.

1. Ensure that the printer is turned on and in ready mode with paper loaded in the tray.
2. Press the **Menu** button ( ) on the control panel until you see “Setup ” on the bottom line of the display..
3. Press the **Enter** button ( ) to access the Menu.
4. Press the scroll button (or) until “Maintenance ” displays on the bottom line and press the **Enter** button ( ) .
5. Press the scroll button (or) to select the required option,“OPC Cleaning ” or “Fuser Cleaning.”
6. Press the Enter button ( ) .

Your printer automatically picks up a sheet of paper from the tray and prints out a cleaning sheet with dust or toner particles on it.

6.3.3 Checking the toner cartridge count

Information about the 'toner cartridge count' can be checked by printing the Configuration Sheet.



6.3.3.1 Remaining Toner: xx%

- Contents: Shows the remaining amount of toner.
- Description: It starts with 100%, and it reduces every 5% unit until it becomes 0%. (A message "Low Toner" is displayed in a LCD when it reaches 10%.)

  * In a low toner status, additional 1,000 sheets can be printed (5% coverage pattern standard-10K cartridge)

6.3.3.2 OPC Count: XXXXXX

- Contents: It starts with 0 and increases to display count.
- Description: It is an imaginary page count that accumulates a rotating time of a Main Motor. When the count reaches 20,000(pages), a message "Replace cart" is displayed in LCD. It means the life span of the toner cartridge (except a toner part) has ended. Even though it is a case that a toner is refilled, the rest of major parts should end, so entire toner cartridge should be replaced. In the worst case, when an OPC rotates over 20,000 pages, it is possible that a toner may overflow. When the count reaches to 20,000 pages, the printed image becomes misty, and an On-Line key that is flashing on a set must be pressed for a single print. If an OPC count is under 8,000 when displaying a message "Remaining Toner:0%", it means that a high-coverage has been used. If an OPC count is over 8,000 and if it has not been reached to 0% yet, a low-coverage should was used.

6.3.3.3 Manufacture Date: 2003.07

- Contents: Shows the product year and the month of the toner cartridge.

6.3.3.4 Supplier: SAMSUNG

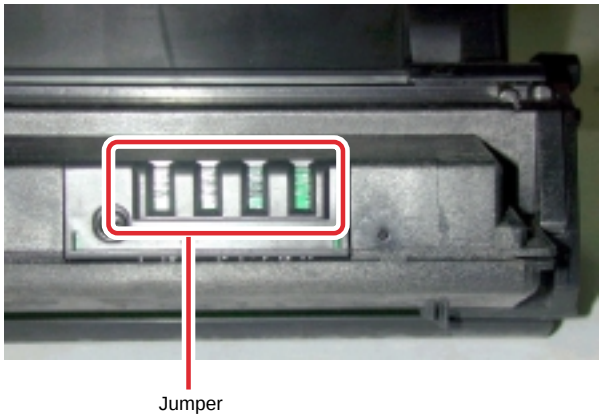
- Contents: shows the brand name of the toner cartridge. (Supplier is Samsung)
- Description: If a supplier is other OEM, the other OEM's name is displayed. If a supplier is different between a set and toner cartridge, a message "invalid toner" will be displayed in a LCD of a set, and a machine turns to an impossible status to print.

6.3.3.5 A checking method of a toner remaining amount

(1) Check a configuration sheet.
(2) Check by using a key of a set. (Setup-maintenance-remain toner)
(3) Check with a network: Check on a Webthru (Setup Menu-remaining toner)

Caution

(1) Please be careful not to damage a toner sensor part when assembling and disassembling a toner cartridge.
(2) Please be careful not to stain anything to jumper (4), which is shown in the picture.



6.4 Consumables and Replacement Parts

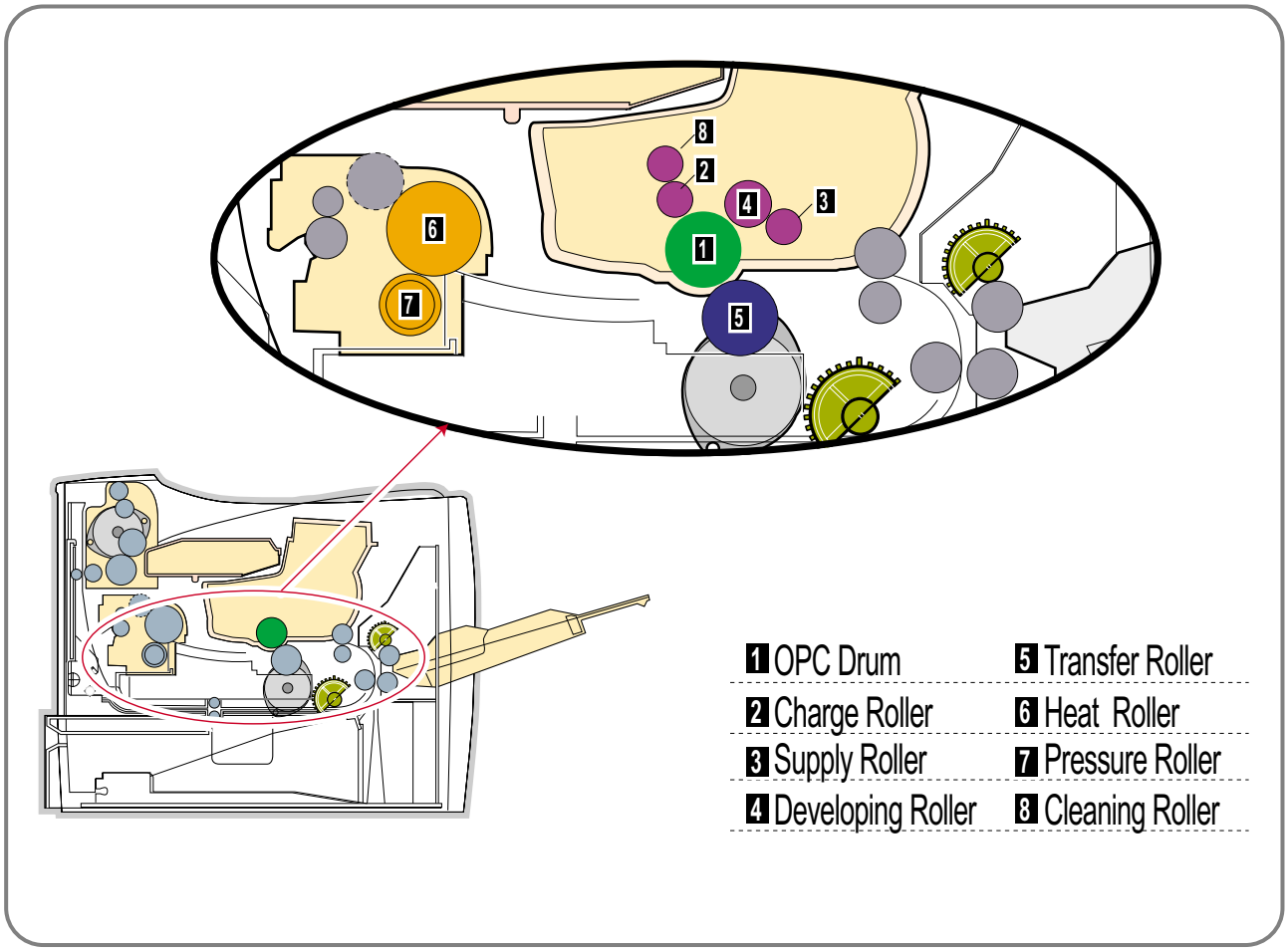
The cycle period outlined below is a general guideline for maintenance.
The example list is for an average usage of 50 transmitted and received documents per day.
Environmental conditions and actual use will vary these factors.
The cycle period given below is for reference only.

COMPONENT	REPLACEMENT CYCLE
Pick-up Roller	100,000 Pages
Paper Feeding Roller(Friction Pad)	100,000 Pages
Transfer Roller	100,000 Pages
Fuser	125,000 Pages
Toner Cartridge	Normal cartridge : 10,000 Pages (A4 5% LSA Pattern) Starter cartridge : 5,000 Pages (A4 5% LSA Pattern)

6.5 Periodic Defective Image

If the delinquent image regularly occurs in the printed-paper, it is due to delinquent or damaged roller. Refer to the table in below and check the condition of the roller.

No	Roller	Defective image	Typical defect
1	OPC Drum	95 mm	white spot on black image or black spot
2	Charge Roller	38 mm	black spot
3	Supply Roller	45 mm	light or dark horizontal image band
4	Developing Roller	49 mm	horizontal image band
5	Transfer Roller	57 mm	image ghost
6	Heat Roller	82 mm	Black spot and image ghost
7	Pressure Roller	92 mm	black spot on the backside



<Rollers Layout>

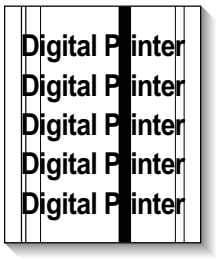
7. Troubleshooting

7.1 The cause and solution of Bad image

7.1.1 Vertical Black Line and Band

• Description

1. Straight thin black vertical line occurs in the printing.
2. Dark black vertical band occur in the printing.



Check and Cause	Solution
1. Damaged develop roller in the Toner cartridge. Deformed Doctor-blade or cleaning-blade.	1. If causes 1 and 2 occur in the toner cartridge, replace the toner cartridge and try to print out.
2. Scratched surface of the charge roller in the toner cartridge.	2. Replace the transfer roller if occurred as No. 3.
3. Partly depression or deformation on the surface of the transfer roller.	

7.1.2 Vertical White Line

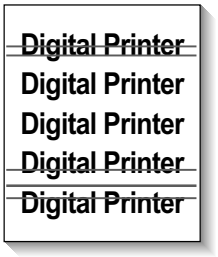
• Description White vertical voids in the image.

Check and Cause	Solution
1. Foreign matter stuck onto the window of internal lenses of LSU mirror.	1. Foreign matter stuck onto the window : Clean the LSU window with recommended cleaner(IPA) Clean the window with a clean cotton swab.
2. Foreign matter or toner particles between the toner cartridge roller and blade. (In case the life of the toner cartridge has been expired, white lines or light image occur in front of the image.)	2.. Replace the toner cartridge.
3. It may occur when Burr and foreign substances are on the window of the toner cartridge frame.	3. No 3. : Remove the foreign matter and burr of the exposure window. (toner cartridge)
4. If the fuser is defective, voids occur periodically at the top of a black image.	4. No. 4. : Open the front cover and check ribs that corresponds to the position of the voids. Remove if found.
5. It may occur when foreign substances are on the OPC Drum.	5. If the problems are not solved, replace the toner cartridge.
6. Partly depression or deformation on the surface of the transfer roller	6. Replace the transfer roller if occured as NO.6

7.1.3 Horizontal Black Band

• Description

1. Dark or blurry horizontal stripes occur in the printing periodically. (They may not occur periodically.)

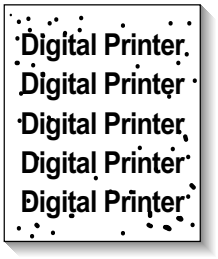


Check and Cause	Solution
1. Bad contacts of the voltage terminals to toner cartridge.	1. Clean each voltage terminal of the Charge, Supply, Develop and Transfer roller. (remove the toner particles and paper particles)
2. The rollers of toner cartridge may be stained. Charge roller = 38mm Supply roller = 45mm Develop roller = 49mm Transfer roller = 57mm	2. Clean the right Gear that has relatively small gap of the teeth in the OPC.
	3. If the malfunction persists, replace the toner cartridge.

7.1.4 Black/White Spot

• Description

1. Dark or blurry black spots occur periodically in the printing.
2. White spots occur periodically in the printing.



Check and Cause	Solution
1. If dark or blurry black spots occur periodically, the rollers in the Toner cartridge may be contaminated with foreign matte or paper particles. (Charge roller : 38 mm interval OPC drum : 95 mm interval)	1. Run OPC cleaning Mode Print and run the Self-test 2 or 3 times.
2. If faded areas or voids occur in a black image at intervals of 95 mm, or black spots occur elsewhere, the OPC drum surface is damaged.	2. In case of 95 mm interval unremovable in 1, cleanly remove foreign substances stuck on the OPC location equivalent to black spots and white spots with a dry duster.
3. If a black image is partially broken, the transfer voltage is abnormal or the transfer roller's life has expired.	3. The transfer roller guarantees 100,000 sheets printing. If the roller's life is expired, replace it.
	4. In case of 95 mm interval unremovable in 1, take measures as to replace the toner cartridge and try to print out.
	5. Clean the inside of the set against the paper particles and foreign matter in order not to cause the trouble.

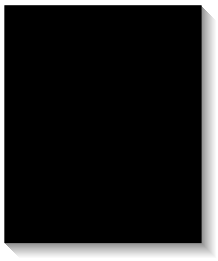
7.1.5 Light Image

• **Description** The printed image is light, with no ghost.

Check and Cause	Solution
1. Develop roller is stained when the toner of toner cartridge is almost consumed.	1. Check if the Toner Save mode is off. Check if the density is light.
2. Ambient temperature is below than 10°C.	2. No 1 : Replace the toner cartridge and try to print out.
3. Bad contact caused by the toner stains between the high voltage terminal in the HVPS and the one in the set.	3. No 2 : Wait 30 minutes after printer is powered on before you start printing.
4. Abnormal output from the HVPS. (Run self-test and check 1~4)	4. No3 : Clean up the contaminated area by the toner.
	5. Replace the HVPS if the problems are not solved by the above four instructions.

7.1.6 Dark Image or a Black Page

• **Description** The printed image is dark.



Check and Cause	Solution
1. No charge voltage in the engine board.	1. Check the state of the connector which connects the engine board and HVPS.
2. Charge voltage is not turned on due to the bad contacts between power supply in the side of the Toner cartridge and charge terminal of HVPS.	2. Clean the high voltage charge terminal.
	3. Replace the HVPS if not solved by the above direction 1 and 2.
3. VD0 signal of the Main PBA is Low state.	4. Replace the LSU Unit or Main PBA.

7.1.7 Uneven Density

• **Description** Print density is uneven between left and right.

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. The pressure force on the left and right springs of the transfer roller is not even, the springs are damaged, the transfer roller is improperly installed, or the transfer roller bushing or holder is damaged.	1. Replace both the left and right Spring Holder.
2. The life of the Toner cartridge has expired.	2. Occur in the toner cartridge gently shake the toner cartridge.
3. The toner level is not even on the toner cartridge roller due to the bad blade.	3.Replace the toner cartridge and try to print out.

7.1.8 Background

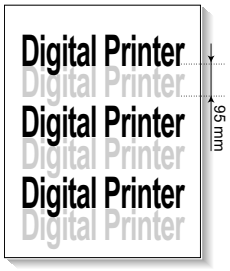
• **Description** Light dark background appears in whole area of the printing.

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. Does character exist less than 2% per a page, and hasn't it been used long time?	1. The toner cartridge is basically designed to print 10,000 sheets with 5% image. If it prints more than 12,000 sheets with 2% coverage, a background can occur.
2. Is a recycled toner cartridge be used?	2. The A/S is not guaranteed if using a recyled the toner cartridger.
3. Has the life span of the toner cartridge ended?	3. Replace the toner cartridge when the life span of it has been ended.
4. Is the movement(Up and Down) of the transfer roller smooth?	4. Clean the bushing part of the transfer roller.
5. Is the HVPS normal?	5. If the problem is still not solved, replace the toner cartridge.
	6. Gently shake the toner cartridge.

7.1.9 Ghost (1)

• **Description** Ghost occurs at 95 mm intervals of the OPC drum in the whole printing.



Check and Cause	Solution
1. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the electrode of the Toner cartridge.	1. Clean the terminals when contaminated by toner particles.
2. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the one in the HVPS board.	2. Occur in the toner cartridge, replace the toner cartridge and try to print out.
3. The life of toner cartridge is expired.	3. Replace the engine board if not solved by the above directions 1-2.
4. Transfer roller lifetime(100,000 sheets) has expired.	4. If not solved by the direction 3, check the transfer roller lifetime and replace it.
5. Abnormal low temperature(below 10°C).	5. Wait about 1 hour after power on before using printer.
6. Damaged cleaning blade in the toner cartridge.	6. Occur in the toner cartridge, replace the toner cartridge and try to print out.

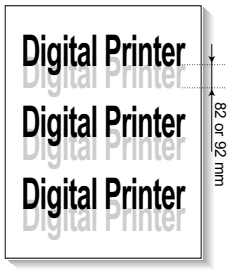
7.1.10 Ghost (2)

• **Description** Ghost occurs at 95 mm intervals of the OPC drum in the whole printing.
(When printing on card stock or transparencies using manual feeder)

Check and Cause	Solution
When printing on card stock thicker than normal paper or transparencies such as OHP, higher transfer voltage is required.	Select 'Thick Mode' on paper type menu from the software application and after using returning to the original mode is recommended.

7.1.11 Ghost (3) : Fuser

• **Description** Ghost occurs at 82 or 92 mm intervals.



Check and Cause	Solution
The temperature of the fuser is maintained high.	1. Disassemble the fuser and remove the contaminated toner particles on the roller and clean the foreign matter between Thermistor and Heat roller. (Caution: can be deformed)

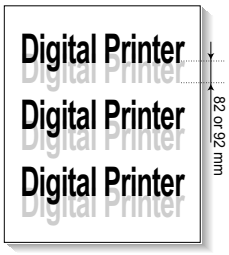
7.1.12 Stains on the Face of Page

• **Description** The background on the face of the printed page is stained.

Check and Cause	Solution
1. Toner leakage due to improperly sealed toner cartridge.	1. Replace the toner cartridge.
2. If the transfer roller is contaminated, stains on the face of page will occur.	2. If the transfer roller is contaminated, run PC Cleaning Mode Print 2 or 3 times. And perform Self-Test 2 or 3 times to remove contamination.

7.1.13 Stains on Back of Page

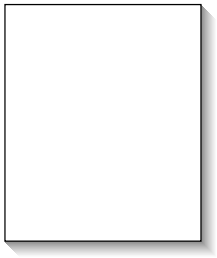
• **Description** The back of the page is stained at 57 or 92 mm intervals.



Check and Cause	Solution
1. 57mm : Transfer roller is contaminated.	1. Perform the OPC Cleaning Mode Print 2 or 3 times. Run Self-Test to remove the contamination of the transfer roller.
2. 92mm : Pressure roller is contaminated.	2. Replace the transfer roller if contaminated severely.
	3. Disassemble the fuser and clean the H/R(Heat Roller) and P/R(Pressure roller). And check the area between H/R and Thermistor. If contaminated, clean the area not to be deformed.

7.1.14 Blank Page Print out (1)

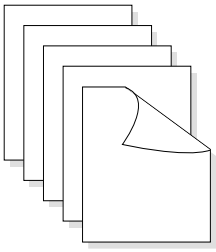
• **Description** Blank page is printed.



Check and Cause	Solution
Bad ground contacts in OPC and/or toner cartridge.	1. Check if the Ground-OPC is defective(set inside left side).
	2. Remove contamination of the terminals of the toner cartridge and the unit.

7.1.15 Blank Page Print out (2)

• **Description**
1. Blank page is printed.
2. One or several blank pages are printed.
3. When the printer turns on, several blank pages print.



Check and Cause	Solution
1. Bad ground contacts in OPC and/or toner cartridge.	1. Remove contamination of the terminals of the toner cartridge.
2. Abnormal solenoid.	2. Perform the engine self test using EDC Mode to check if the Solenoid is normal.
	3. If not solved by the above directions 1-2, Replace the engine board.
	4. Turn the power off, delete the data of PC and try printing again.

7.2 The cause and solution of the bad discharge

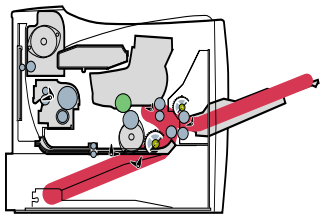
7.2.1 Wrong Print Position

• **Description** Printing begins at wrong position on the paper.

Check and Cause	Solution
Wrong sense time caused by defective feed sensor actuator.	Replace the defective actuator

7.2.2 JAM 0

• **Description**
1. Paper is not exited from the cassette.
2. Jam-0 occurs if the paper feeds into the printer.

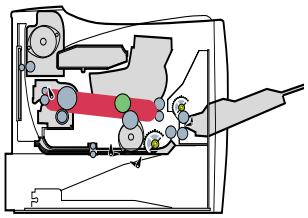


Check and Cause	Solution
1. Check the Solenoid by using EDC Mode.	1. Replace the solenoid.
2. Check if the pad is loose due to bad sealing of the side-pad.	2. Replace the side-pad Assembly L or R, if necessary.
3. Check the surface of the roller-pick-up for foreign matter.	3. Clean with soft cloth dampened with IPA(Isopropyl Alcohol) or water.
4. If continuous clusters occur, check whether the assembly slot between shaft-pickup and housing-pickup opens or is broken away.	4. Replace the Main PBA and/or Sensor.
5. If the paper feeds into the printer and Jam 0 occurs, perform EDC Mode to check feed-sensor of the engine board.	

7.2.3 JAM 1

• Description

1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.

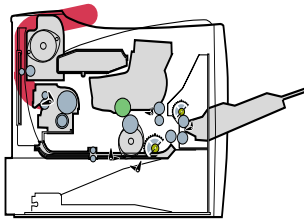


Check and Cause	Solution
1. If the recording paper is jammed in front of or inside the fuser.	1. Replace the SMPS or Exit-Sensor. 2. Replace the Main PBA.
2. If the recording paper is stuck in the discharge roller and the fuser just after passing through the Actuator-Feed, Feed Actuator may be defective.	3. Reassemble the Actuator-Feed and Spring-Actuator if the movement is bad.

7.2.4 JAM 2

• Description

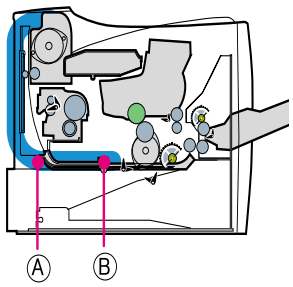
1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.



Check and Cause	Solution
1. If the paper is completely fed out of the printer, but Jam 2 occurs : Exit sensor is defective. • After the paper is completely discharged, actuator Exit should return to the original position to shut the photo-sensor. Sometimes it takes longer hour than it should and does not return.	1. Check if the exit sensor actuator is defective. • Check if the actuator exit is deformed (Check if the lever part is deformed in shape). • Check whether burrs occur in the assembly part of the actuator exit or not and if the actuator is smoothly operated. • Check if foreign matter and wire get caught in the actuator exit's operation.
2. If the paper is rolled in the Fuser Roller: • This occurs when a Guide claw is broken away or transformed. • It occurs when the Spring of a Guide claw is broken away or transformed. • It occurs when the Heat-Roller or Pressure-Roller is seriously contaminated with the toner.	2. If the paper is stuck in the fuser : disassemble the fuser and remove the jammed paper, and clean the surface of the pressure roller with dry gauze.
3. Paper is accordion in the fuser.	3. Remove the jammed paper after disassembling the fuser : Clean the surface of the pressure roller with dry gauze. • Remove the toner particles stained on the rib. • Check the assemblage and performance of the exit.

7.2.5 JAM Duplex 1

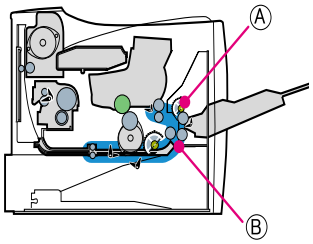
• **Description** A message 'Jam duplex 1' is displayed in a LCD window.



Check and Cause	Solution
1. It is a case when a paper cannot operate a duplex sensor. 2. It is a case when a paper cannot reach to a duplex sensor due to a paper jam on a duplex path.	1. Replace a SMPS or main PBA 2. A case that a paper jam occurs on (A) after it is reversed: replace a 2nd exit roller after checking its operation. 3. A case that a paper jam occurs on (B) after it is reversed: replace a duplex roller after checking its operation

7.2.6 JAM Duplex 2

• **Description** A message 'Jam duplex 2' is displayed in a LCD window.



Check and Cause	Solution
1. It is a case that a paper cannot pass a duplex sensor. 2. It is a case that a paper cannot reach to a registration sensor after it is passed a duplex sensor.	1. Replace a SMPS or main PBA. 2. A case that a leading edge of a paper is jammed on (A) check an operation of a guide front. If it is worn or defective, replace it. 3. Check an operation of a feed roller and a registration roller. If they are worn or defective replace them.

7.2.7 Multi-Feeding

• **Description** Multiple sheets of paper are fed at once.

Check and Cause	Solution
1. Check the Guide side L/R or Guide Rear in the Cassette, if the position is correct.	1. Replace the solenoid if necessary.
2. Solenoid malfunction(the solenoid does not work properly): Perform EDC Mode.	2. Replace the Main PBA.
3. Pad-Friction is contaminated with foreign matter.(oil...)	3. Clean the pad friction with soft cloth dampened with IPA(Isopropyl Alcohol).
4. The face of paper is blended.	4. Use the smooth paper.

7.2.8 Paper rolled in the fuser

• **Description** If contaminated at intervals of 57mm on the back of a paper.

Check and Cause	Solution
1. Contamination of the pressure roller or heat roller (Background, Hot off set).	1. After disassembling the fuser, clean contamination between the heat roller and the thermostor and remove the contamination of the pressure roller.
2. Check the claw of the fuser whether it is deformed.	2. If there is heavy background, repair it by the background troubleshooting method.
	3. Clean the surface of the heat roller with IPA or water
	4. Check the warp or separation of the print claw and the holder plate claw, and then manage it.

7.2.9 Paper rolled on the OPC Drum

• **Description** Paper is rolled up in the OPC.

Check and Cause	Solution
1. Paper is too much thin. 2. The face of paper is curled.	1. Recommend to use normal paper. 2. How to remove the rolled paper in the OPC. • Remove the paper while turning the OPC against the ongoing direction. • Clean fingerprints on the OPC softly with soft cloth dampened with tissue.

7.3 The cause and solution of the malfunction

7.3.1 Fuser Error

• **Description** A message "Open fuser/Over heat/Low heat' is displayed in a LCD panel.

Check and Cause	Solution
1. Check whether a thermostat, AC wire, and heat lamp are open or not.	1. Replace the fuser if a thermostat is open.
2. Check whether a thermistor is open or not.	2. Replace the fuser if a thermistor sensor is located deep inside of a sponge.
3. Heat lamp ON/OFF test	3. Check whether the overheat mode circuit operates normally or not.
4. It could not operate due to a gear of a fuser is melted.	4. Replace the fuser.

7.3.2 LSU Error

• **Description** A message "PMOTOR ERROR/HSYNC ERROR' is displayed in a LCD panel.

Check and Cause	Solution
1. Check whether the LSU connector is disconnected or not.	- Replace a LSU
2. Check whether the LSU motor is rotating or not.	- Replace a main board if the same error occurs again after replacing a LSU.
3. Check the HSYNC signal.	

7.3.3 Not function of the gear of the fuser due to melting away

• **Description** The motor breaks away from its place due to gear melting away.

Check and Cause	Solution
1. Check the Heat Lamp.	1. Replace the Fuser. 2. Replace the Main PBA. 2. Replace the SMPS.

7.3.4 Paper Empty

• **Description** The paper lamp on the operator panel is on even when paper is loaded in the cassette.

Check and Cause	Solution
1. Bending or deformation of the actuator of the paper sensor.	1. Replace the defective actuator.
2. The function of the engine board is defective	2. Replace the Sensor PBA.
3. Check the Connector.	

7.3.5 Paper Empty without indication

• **Description** The paper lamp on the operator panel does not come on when the paper cassette is empty.

Check and Cause	Solution
1. Bending or deformation of the actuator of the paper sensor.	1. Replace the defective actuator.
2. The function of the engine board is defective	2. Replace the engine board.

7.3.6 Cover Open

• **Description** The ERROR lamp is on even when the print cover is closed.

Check and Cause	Solution
1. The hook lever in the top cover may be defective.	1. Replace the hook lever, if defective.
2. Check the connector and circuit of the cover switch department in the Main Control board.	2. Check the insertion of the Cover Open S/W Connect.
	3. Replace the Main Control board or Cover Open S/W.

7.3.7 No error message when the cover is open

• **Description** The ERROR message does not come on even when the printer cover is open

Check and Cause	Solution
1. Check the connector and circuit of the cover switch department in the Main Control board. Perform EDC mode	1. Check the insertion of the Cover Open S/W Connect. 2. Replace the Main Control board or Cover Open S/W.

7.3.8 Defective motor operation

• **Description** Main motor is not driving when printing, and paper does not feed into the printer, resulting 'Jam 0'.

Check and Cause	Solution
1. The Motor harness or Motor PCB may be defective.	1. Check the motor harness, replace it, if defective.
2. Check the motor operation in the EDC Mode.	2. Replace the Main PBA.

7.3.9 No Power

• **Description** When system power is turned on, all lamps on the operator panel do not come on.

Check and Cause	Solution
1. Check if the power input and SMPS output are normal.	1. Replace the power supply cord or SMPS.
2. Check the inferiority of LED-Panel or LDC window on the front-cover if the OP panel does not appear after normal warming-up.	2. Replace the control board. 3. Replace the OP panel.

7.3.10 Vertical Line Getting Curved

• **Description** When printing, vertical line gets curved.

Check and Cause	Solution
1. If the supply of +24v is unstable in the Main Control board linking with LSU, check drive by EDC Mode: LSU Check.	1. Replace LSU.
2. Chect the Deve PBA in the Toner Cartridge.	2. Replace theToner Joint PBA. 2. Replace the MainPBA.

7.4 Toner Cartridge Service

It is not guaranteed for the default caused by using other toner cartridge other than the cartridge supplied by the Samsung Electronic or caused by non-licensed refill production.

7.4.1 Precautions on Safe-keeping of Toner Cartridge

Excessive exposure to direct light more than a few minutes may cause damage to the cartridge.

7.4.2 Service for the Life of Toner Cartridge

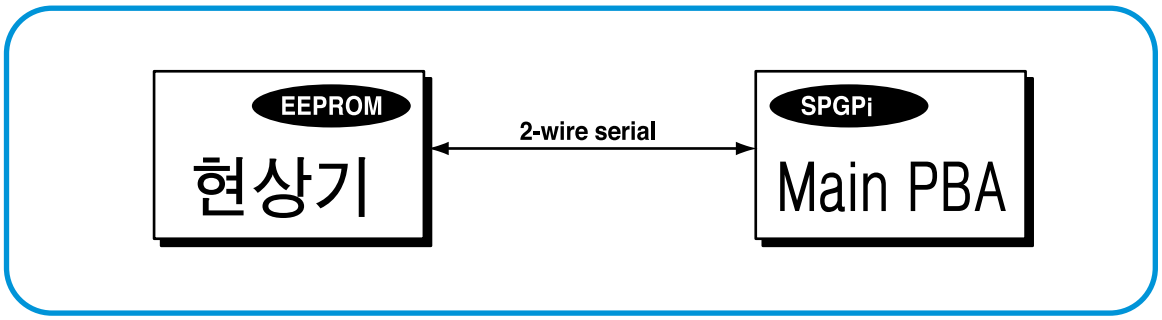
If the printed image is light due to the life of the toner, you can temporarily improve the print quality by redistributing the toner(Shake the toner cartridge), however, you should replace the toner cartridge to solve the problem thoroughly.

7.4.3 Distinguish function for choice cartridge

• Distinguish function for choice cartridge

An EEP ROM is mounted to a cartridge for distinguishing a choice toner cartridge. Items written in below are detected by checking up memory information.
If the data of the EEP ROM is broken, it cannot be detected.

1) Detecting existence of a toner cartridge: It detects whether a toner cartridge is mounted or not.
2) Detecting a serial number of a toner cartridge.
3) Detecting a toner cartridge supplying company: If it is not Samsung's, it is not operated.
4) Detecting an OPC rotating counter: It detects the life span of an OPC drum.



• Distinguish a refilled cartridge. (with eyes)

1) Check whether One-way screw is damaged or not
2) Check the cartridge on configuration sheet(Print out the self-test configuration)
: Manufacture date and serial number of toner cartridge are different(permissible range : +/- 1).

7.4.4 Error message (LCD window) related in a toner sensor

It explains a message related in toner sensor in a LCD.

7.4.4.1 Invalid Toner

- Contents: It is displayed when a supplier is different between a toner cartridge and a set. If this message is shown up, a printing process cannot operate.
- Solution: Attach a suitable toner cartridge (the same supplier's) to a set. (A unique key has been applied.)

7.4.4.2 Low Toner

- Contents: This message shows up when a message "remaining toner: 10%" is displayed in a cartridge count information. And the same message shows up when an OPC count becomes 18,000 (page).
- Solution: It means that a toner in the toner cartridge has been almost ended. Repare the new toner cartridge.

7.4.4.3 Replace Cartridge

- Contents: This message shows up when an OPC count becomes 20,000 (pages). It means the life span of a toner cartridge (except a toner part) has been ended. Even though a case that a toner is refilled, the rest of major parts have been ended, so entire toner cartridge might be replaced.
- Solution: If an OPC rotates about 20,000 (page), in a worst case, a toner overflows and it may cause a system fail. Therefore, recommend a user to replace a toner cartridge. When continuously using, even though a count reaches to 20,000 pages, a printed image becomes misty, and an on-line key that is flashing on a set must be pressed for a single print.

7.4.5 Signs and Measures at Poor toner cartridge

Fault	Signs	Cause & Check	Solution
Light image and partially blank image (The life is ended.) 	• The printed image is light or unclean and untidy. • Some part of the image is not printed. • Periodically a noise as "tick tick" occurs.	1. If the image is light or unclean and untidy printed image - Shake the toner cartridge and then recheck. (1)NG: Check the weight of the toner cartridge (2)OK: Lack of toner, so the life is nearly closed. 2. Some part of image is not printed - Shake the toner cartridge and then recheck. (1)NG: Check the weight of the toner cartridge and clean the LSU window with a cotton swab, then recheck. (2)OK: Lack of toner, so the life is nearly closed. 3. Periodically a noise as "tick tick" occurs - Measure the cycle and the weight of the toner cartridge. 4. White vertical stripes on the whole screen or partly : Check the weight of the toner cartridge.	1. All of 1, 2, 3 above- If it become better by shaking, replace with a new toner cartridge after 50-100 sheets in the closing state of the life span. 2. In case of 2- If it becomes better after cleaning the LSU window, then the toner cartridge is normal. (Because of foreign substance on the LSU window, the image has not been printed partly.) 3. In case of 3- If the cycle of noise is about 2 seconds, the toner inside the toner cartridge has been nearly exhausted.(Purchase and replace with a new toner cartridge after using about 200 sheets at the point of occurrence) 4. In case of 3- This is a phenomenon caused by lack of toner, so replace with a new toner cartridge.
Toner Contamination	• Toner is fallen on the papers periodically. • Contaminated with toner on prints partly or over the whole surface.	1. Toner is fallen on the paper periodically. (1)Check the cycle of the falling of the toner. (2)Check the appearance of both ends of the toner cartridge OPC drum. 2.The center of the printed matter is contaminated with toner. (1)Check whether foreign substances or toner are stuck to the terminal (contact point) of the toner cartridge. (2)Check whether the state of the terminal assembly is normal.	1. If both ends of the OPC drum are contaminated with toner: Check the life of the toner cartridge. 2. Check whether it could be recycled. 3. If it cannot be recycled: Replace the toner cartridge.

Fault	Signs	Cause & Check	Solution
White Black spot 	• Light or dark black dots on the image occur periodically. • White spots occur in the image periodically.	1. If light or dark periodical black dots occur, this is because the toner cartridge rollers are contaminated with foreign substance or paper particles. (1)38mm interval : Charged roller (2)95mm interval : OPC cycle 2. If white spots occur in a black image at intervals of 95mm, or black spots occur elsewhere, the OPC drum is damaged or foreign substance is stuck to the surface. 3. If a black and white or graphic image is partially broken at irregular intervals, the transfer roller's life has been expired or the transfer voltage is abnormal.	1. In case of 1 above - Run OPC Cleaning Mode Print 4-5 times repeatedly to remove. Especially check foreign substance on the OPC surface, then remove them with a clean gauze moistened with IPA(Isopropyl Alcohol) not to damage OPC if necessary. ⚠ **Never use usual alcohol.** 2. In case of 2 If they are not disappeared by running OPC Cleaning Mode Print 4-5 times. : at intervals of 38mm - Replace the toner cartridge. : at intervals of 95mm - Remove foreign substance. : Broken image - Replace the toner cartridge according to carelessness. 3. In case of 3 - Exchange the transfer roller because the life of the transfer roller in use has been expired. (Check the transfer voltage and readjust if different.)
Recycled product	• Poor appearance of the toner cartridge. • Unclean and rough printouts. • Bad background in the image.	1. Poor appearance of the toner cartridge. (1)Check the damage to label and whether different materials are used. (2)Check the appearance of parts of the toner cartridge, such as frame, hopper. 2. Unclean and rough printouts. (1)Check whether foreign substance or toner are stuck to the terminal (contact point) of the toner cartridge. (2)Check whether the state of the terminal assembly is normal.	1. In case of 1 - (1)If there is an evidence of disassembling the toner cartridge. (2)If materials other than normal parts of the toner cartridge are added or substituted. 2. In case of 2 - If there are any abnormals in connection with the situation of 1. (1)It occurs when the toner cartridge is recycled over 2 times. (2)If toner nearly being expired are collected to use, it is judged as the recycled toner cartridge.

Fault	Signs	Cause & Check	Solution
Ghost & Image Contamination	• The printed image is too light or dark, or partially contaminated black. • Totally contaminatedblack. (Black image printed out) • The density of printouts is too dark and ghost occurs.	1. The printed image is too light or dark, or partially contaminated black. (1)Check whether foreign substance or toner are stuck to the terminal(point of contact) of the toner cartridge. (2)Check whether the terminal assembly is normal.	1. All of 1, 2, 3 above (1)Remove toner and foreign substances adhered to the contact point of the toner cartridge. (2)The contact point of the unit facing that of the toner cartridge also must be cleaned. (3)If the terminal assembly is unsafe: • Fully stick the terminal to or reassemble it after disassembling. • Disassemble the side plate and push the terminal to be stuck, then reassemble it.
		2. Totally contaminated black. (Black image printed out) (1)Check whether foreign substances are stuck to the terminal(point of contact) of the toner cartridge and the state of assembly. (Especially check the charged roller terminal.)	2. In case of 2 It is a phenomenon when the OPC drum of the toner cartridge is not electrically charged. Clean the terminals of the charged roller, then recheck it.
		3. The printed image is dark and ghost occurs. (1)Check foreign substance attached to the terminal (point of contact) of the toner cartridge and the state of assembly. (Especially check the developing roller terminal.)	3. In case of 3 It is a phenomenon as the developing bias voltage of the toner cartridge. Clean the terminals of the developing roller, then recheck it.

7.5 The cause and solutions of bad environment of the software

7.5.1 The printer is not working (1)

• **Description** While Power turned on, the printer is not working in the printing mode.

Check and Cause	Solution
1. Run Self-Test Mode: Turn the power on while pressing the test printing button for 2 or 3 seconds before printing works.	1.Check the power of the printer and perform the Self-Test. If the test printing works, that means no problems in the printer itself. If the test printing does not work, that means bad functioning of the printer(not because of software).
2. Check if the PC and the printer is properly connected and the toner cartridge installed.	2. Replace the printer cable. If the problems not solved even after the cable replaced, check the amount of the remaining tone. (refer to Toner Cartridge Service 4-5)
3. Printing is nor working in the Windows.	3. Check if the connection between PC and printer port is proper. If you use windows, check if the printer driver in the controller is set up. If the printer driver is properly set up, check in which program the printing is not working. The best way to find out is to open the memo pad to check the function of printing. If it is not working in a certain program, adjust the setup the program requires. Sometimes, the printout is normal within the Windows basic programs, but it's not working in a particular program. In such case, install the new driver again. If not working in the Windows basic program, Check the setup of the port of CMOS is on ECP. And check the address of IRQ 7 and 378
4. Check if the printer cable is directly connected to peripheral devices	4. If the scanner needs to be connected to the printer, first the remove the scanner from the PC to see if the printer is properly working alone.

7.5.2 The printer is not working (2)

• Description After receiving the printing order, no response at all or the low speed of printing occurs due to wrong setup of the environment rather than malfunction of the printer itself.

Check and Cause	Solution
1. Secure more space of the hard disk.	1. Not working with the message 'insufficient printer memory' means hard disk space problem rather than the RAM problem. In this case, provide more space for the hard disk. Secure more space using the disk utilities program.
2. Printing error occurs even if there is enough space in the hard disk.	2. The connection of the cable and printer port is not proper. Check if the connection is properly done and if the parallel port in CMOS is rightly set up.
3. Check the parallel-port-related items in the CMOS Setup.	3. As a printer port, Select ECP or SPP among SPP(Normal), ECP, and EPP modes(increase printing speed) SPP normal mode support 8-bit data transfer, while ECP Mode transfer the 12-bit data.
4. Reboot the system to print.	4. If the regular font is not printing, the cable or the printer driver may be defective. Turn the PC and printer off, and reboot the system to print again. If not solved, double-click the printer in my computer If the regular fonts are not printed this time again. the cable must be defective so replace the cable with new one.

7.5.3 Abnormal Printing

• **Description**	The printing is not working properly even when the cable has no problem. (even after the cable is replaced) If the printer won't work at all or the strange fonts are repeated, the printer driver may be defective or wrong setup in the CMOS Setup.

Check and Cause	Solution
1. Set up the parallel port in the CMOS SETUP.	1. Select SPP(Normal) or ECP LPT Port the among ECP, EPP or SPP in the CMOS Setup.
2. Printer Driver Error.	2. Check the printer in My Computer.(to see if the printer driver is compatible to the present driver or delete the old driver, if defective and reinstall the new driver)
3. Error message from insufficient memory. (The printing job sometimes stops or due to insufficient virtual memory, but it actually comes from the insufficient space of the hard disk.)	3. Delete the unnecessary files to secure enough space of the hard disk and start printing job again.

7.5.4 SPOOL Error

• **Description**	To spool which stands for "simultaneous peripheral operations online" a computer document or task list (or "job") is to read it in and store it, usually on a hard disk or larger storage medium so that it can be printed or otherwise processed at a more convenient time (for example, when a printer is finished printing its current document).

Check and Cause	Solution
1. Insufficient space of the hard disk in the directory assigned for the basic spool.	1. Delete the unnecessary files to provide more space to start printing job.
2. If the previous printing error not solved.	2. If there are some files with the extension name of ****.jnl, Delete them and Reboot the Windows to restart printing job.
3. When expected to collide with other program.	3. Shut down all other programs except the current one, if possible.
4. When an application program or the printer driver is damaged.	4. Delete the printer driver completely and reinstall it.
5. When some files related to OS are damaged or virus infected.	5 After rebooting the computer, check for viruses, restore the damaged files and reinstall the program to do the printing job.
6. Memory is less than suggested one.	6. Add up enough memory to the PC.

How to delete the data in the spool manager.

In the spool manager, the installed drivers and the list of the documents waiting to be printed are shown. Select the document to be deleted and check the delete menu.

If you intend to delete the current document being printed, the data being transferred to the printer will be put out and then the document is removed. Before choosing the document, the menu is still inactive.

Or put the document out of the list and repeat the routine as in the above or finish the spool manager.

Memo

SAMSUNG

8. Exploded Views and Parts List

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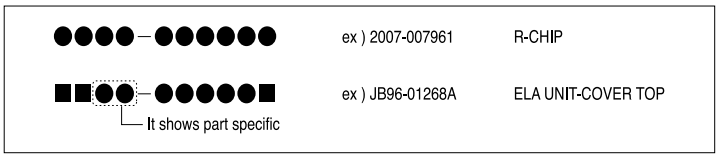
Part Number & Description format.

Part numbers and descriptions are defined according to a company standard. The information below will help you to understand the part number format and assist when ordering spare parts.

• **There are two types of Part number format.**



(● : number ■ : letter)

Type 1 : This format is used throughout Samsung on all product ranges.
Typically it is used for small components and electronic parts.

Type 2 : This format is controlled by individual Samsung Divisions and is used on specific products, typically for mechanical parts. Type 2 format part numbers fall into 2 categories:

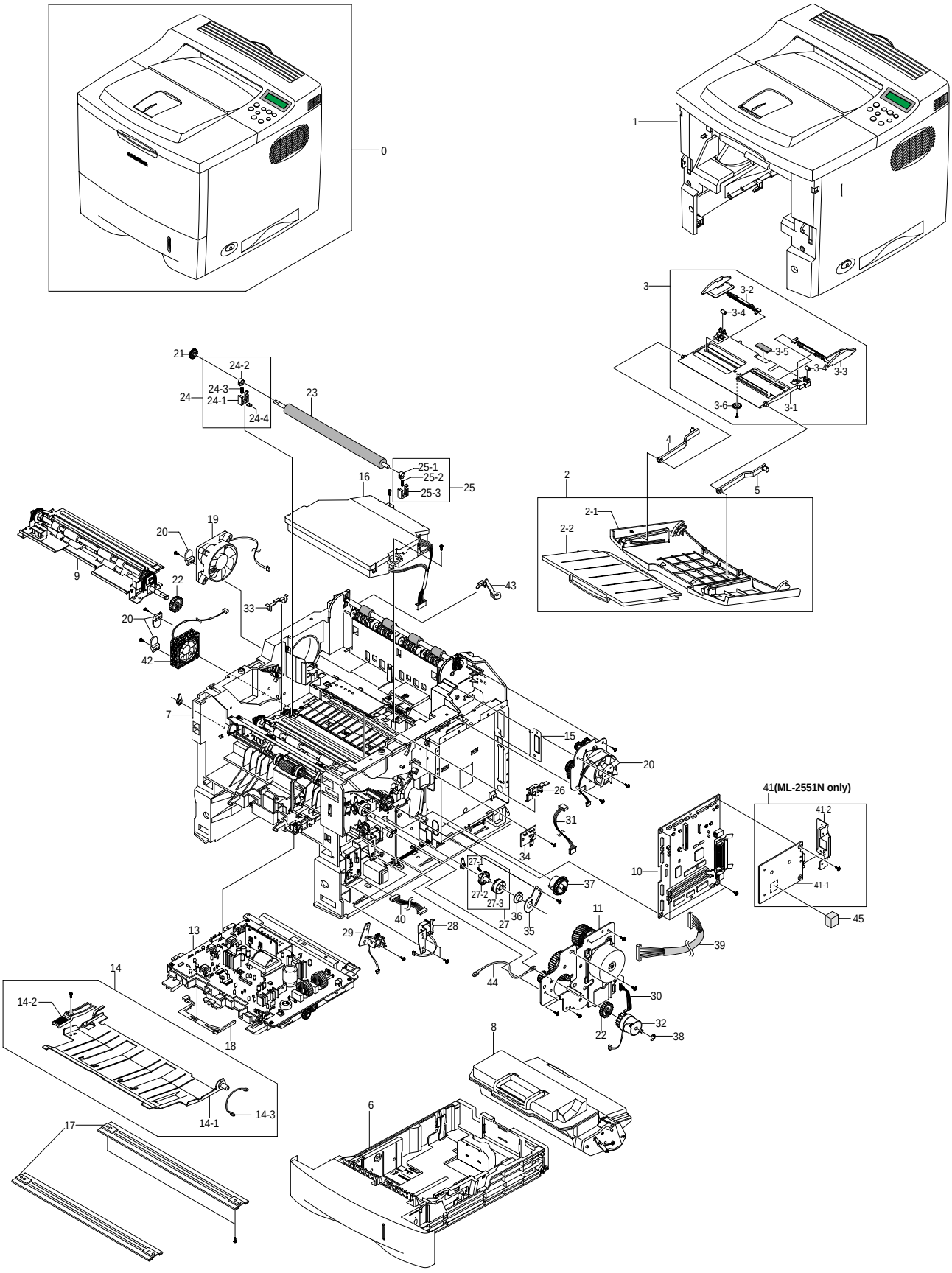
• **A/S privately used part :** It is only used for A/S .

• **Ass'y part :** Assemblies consisting of 2 or more parts. Also used for Service manuals, user guides and diagrams.

• Ass'y parts and A/S privately used Parts can be distinguished by the part Code and Description. They are always Type 2 format. The 2 leading characters indicate private or assembly parts.

DIVISION	PART CODE	DESCRIPTION
A/S Private	**81-****** (JB81-00039A)	AS-********** (AS-USE)
ASS'Y Part	**75-****** (JB75-00068A)	MEC-******** (MEC-CHUTE)
ASS'Y Part	**92-****** (JB92-01131A)	PBA ********* (PBA MAIN-CONTROLLER)
ASS'Y Part	**97-****** (JB97-01089A)	MEA ********* (MEA UNIT-PULLEY IDLE)

8.1 Main Assembly



Main Assembly Parts List(1/2)

SA : Service Available
O : Service available **X** : Service not available

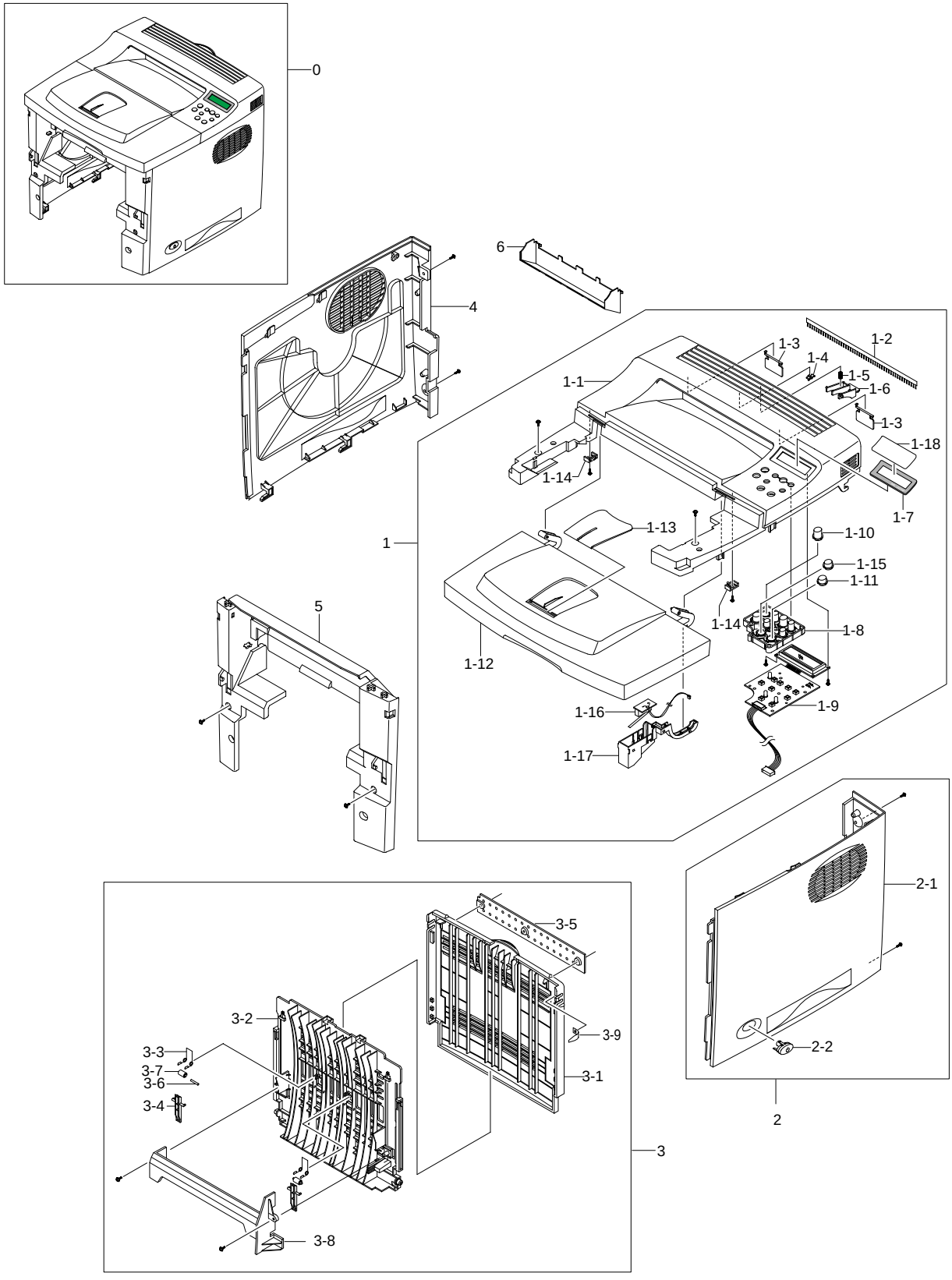
No.	Location	Description	SEC.Code	Q'ty	SA	Remark
1	H6001	ELA HOU BASE-HOUSING ; SEC,KOR,22	JC96-02695S	1	X	ML-2550
		ELA HOU BASE-HOUSING ; SEC,KOR,22	JC96-02695X	1	X	ML-2551N
		ELA HOU BASE-HOUSING ; SEC,KOR,22	JC96-02993F	1	X	ML-2555G
2	Z2293	ELA UNIT-COVER MP ; ML-2060A,SEC,220V	JC96-02679A	1	O	
2-1	Z2204	COVER-M-MP ; ML-2060,ABS,V0,SEC	JC63-00127A	1	O	
2-2	T4136	TRAY-M-EXTEND MP ; ML-2060,ABS	JC63-00128A	1	O	
3	K3145	ELA UNIT-KNOCKUP MP ; ML-2060A,SEC,220V	JC96-02680A	1	O	
3-1	P5146	PLATE-M-KNOCK UP MP ; ML-2060,ABS	JC61-00686A	1	O	
3-2	G2299	PMO-SIDE GUIDE MP(L) ; ML-2060,PC+ABS	JC72-01005A	1	O	
3-3	G2301	PMO-SIDE GUIDE MP(R) ; ML-2060,PC+ABS	JC72-01006A	1	O	
3-4	K5006	PMO-IDLE KNOCK UP MP ; ML-2060,POM,WHITE	JC72-01004A	2	O	
3-5	P0019	MPR-PAD KNOCK UP MP ; ML-6060A,CR+CORK	JC74-00011A	1	X	
3-6	G0369	GEAR-PINION ; SF4000,POM,WHT,M1,Z16	JG66-40003A	1	O	
4	T4137	TRAY-M-LINK MP(L) ; ML-2060,HIPS	JC63-00129A	1	O	
5	T4138	TRAY-M-LINK MP(R) ; ML-2060,HIPS	JC63-00130A	1	O	
6	K3096	ELA UNIT-CASSETTE(550) ; ML-2150,SEC	JC96-02845B	1	O	
7	B0075	ELA UNIT-FRAME BASE ; ML-2550,SEC,220V	JC96-02627G	1	O	⚠ 220V
8	T2060	ELA UNIT-DEVE KIT ; ML-2550,SAMSUNG	JC96-02639J	1	O	5K
9	K3171	ELA UNIT-REGI ; ML-2060A,SEC,220V	JC96-02626A	1	O	
10	Z1024	PBA MAIN-CONTROLLER	JC92-01658D	1	O	ML-2550/ML-2550S ML-2551N ML-2551NS
		PBA MAIN-CONTROLLER	JC92-01658C	1	O	ML-2555G
11	M2098	ELA UNIT-MOTOR MAIN CAR 25 ; ML-2550,XEROX	JC96-02725B	1	O	
12	M2097	ELA UNIT-MOTOR EXIT CARDINAL2 ; ML-2550,XE	JC96-02857A	1	O	
13	S7016	ELA HOU-SMPS_HVPS_V2(220V) ; ML-2550,SEC	JC96-02777B	1	X	⚠ 220V
14	K3567	MEA UNIT-GUIDE FRONT, DUP ; ML-2150,SEC	JC97-01715A	1	O	
14-1	G2085	GUIDE-P-FRONT, DUP ; ML-2060,SECC,0.8,76	JC61-00660A	1	O	
14-2	L4035	LEVER-M-OPEN, DUP ; ML-2060,PC,2.5,12,40	JC66-00443A	1	O	
14-3	H1067	CBF HARNESS-EARTH (TX MOTOR) ; SF-3100,CBF	JC39-00017A	1	O	None N/W Card
15	D2001	BRACKET-P-BLADE ; ML-2060,SECC,1.2,20,230	JC61-00634A	1	X	ML-2550 Only
16	L7044	UNIT-LSU_CARDINAL_25 ; ML-2550,600DPI	JC59-00019B	1	O	
17	K2861	BAR-P_CROSS BOTTOM ; ML-2060,SECC T1	JC71-00042A	2	O	
18	K3816	PMO-ACTUATOR EMPTY ; ML-2060,PC,BLK	JC72-00991A	1	O	
19	F5016	FAN-DC CARDINAL ; AD0424LS-C50	JC31-00029A	1	O	
20	F5029	STOPPER-M-FAN80 ; ML-2060,ABS,BLK	JC61-00667A	3	O	
21	G0439	GEAR-TR29 ; ML-6060A,POM,BLK,0.6,29	JC66-00039A	1	O	
22	G0415	GEAR-REGI Z25 ; ML-2060,M90-44,0.8,25,5.6	JC66-00420A	2	O	
23	Z3014	ROLLER-TRANSFER ; ML-2060,NBR SPONGE+SUM/N	JC66-00540A	1	O	
24	K3139	ELA UNIT-HOLDER TR R ; ML-6060A,SAMSUNG	JC96-01729A	1	O	
24-1	K3741	PMO-TRANSFER HOLDER R ; ML-6060A,ABS,PANTO	JC72-41145C	1	X	
24-2	K3852	PMO-BUSHING TR ; ML-5000A,POM,BLK	JC72-41142A	1	X	
24-3	Z4278	SPRING-TR R HAWK ; ML-6060A,SUS 304 WPB	JC61-00046A	1	X	
24-4	K3379	IPR-PLATE TR ; ML-5000A,BSBM1/2H,T0.2	JC70-11053A	1	X	

Main Assembly Parts List(2/2)

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
25	K3138	ELA UNIT-HOLDER TR L ; ML-6060A,SAMSUNG	JC96-01730A	1	O	
25-1	K3852	PMO-BUSHING TR ; ML-5000A,POM,BLK	JC72-41142A	1	X	
25-2	K4278	SPRING-TR R HAWK ; ML-6060A,SUS 304 WPB	JC61-00046A	1	X	
25-3	K3741	PMO-TRANSFER HOLDER L ; ML-6060A,ABS,GRAY	JC72-41145C	1	X	
26	C1013	CAP-M-GEAR ; ML-2060,POM,BLK	JC67-00039A	1	O	
27	G0467	MEA UNIT-GEAR P/UP MP CARDINA ; ML-2150	JC97-01738A	1	O	
27-1	Z4145	SPRING--CAM MP ; ML-6100,SUS304-WPB,2.4,0	JC61-00003A	1	O	
27-2	P2055	GEAR-MP PICK_UP ; ML-2060,M90-44,0.8,37,20	JC66-00423A	1	O	
27-3	H4008	GEAR-MP HOLDER_CAM ;ML-2060,M90-44,0.8,37	JC66-00424A	1	O	
28	S8014	SOLENOID-MAIN ; DLH-34L008-05,ML-2150,24V	JC33-00012A	1	O	
29	S8015	SOLENOID-MP ; DLH-34L008-04,ML-2150,24V,8O	JC33-00013A	1	O	
30	M2052	CBF HARNESS-MAIN MOTOR ; ML-2150,CBF,UL 10	JC39-00257A	1	O	
31	M2053	CBF HARNESS-MOTOR ; ML-1650,WIRE HARNESS	JC39-00157A	1	O	
32	C9048	MEP-CLUTCH FEED CARDINAL ; ML-2150,4.0W	JC47-00009A	1	O	
33	C1078	PMO-CAP TR ; ML-5000A,PC,BLK	JC72-41292A	1	O	
34	M0308	PBA SUB-COVER JOINT ; ML-2150,SEC,KOREA	JC92-01510A	1	O	
35	S4013	BRACKET-P-SHAFT MP ; ML-2060,SECC,1.2	JC61-00755A	1	O	
36	P2038	BEARING-PICK UP ; ML-80,POM	JC66-10202A	1	O	
37	P2056	GEAR-PICK_UP CAM ; ML-2060,M90-44,0.8,29	JC66-00533A	1	O	
39	H1247	CBF HARNESS-SMPS ; ML-2150,CBF,UL 1061,24P	JC39-00253A	1	O	
40	H1172	CBF HARNESS-MPF JOINT ; ML-3550,UL1061AWG2	JC39-00205A	1	O	
41	K3007	ELA HOU-NPC3_VE ; ML-2551N,SAMSUNG,NPC	JC96-03393A	1	O	ML-2551N Only
41-1	N0000	BRACKET-NPC ; MLC-500,SCEE,T0.8	JC61-00809A	1	X	
41-2	M0233	PBA SUB-NPC3_VE ; ML-2550,XEROX, SAMSUNG	JC92-01676A	1	X	
42	F5017	FAN-DC CARDINAL ; AD0424LS-C50,ML-2550	JC31-00027B	1	O	
43	K3819	PMO-ACTUATOR OUTFULL ; ML-2150,ABS,BLK	JC72-01310A	1	O	
44	L5014	CBF HARNESS-OPE ; SF3000,CBF,UL1007,100	JB39-40532A	1	O	
45	K4265	STOPPER-M_NETWORK ; ML-2550,PP,18,BLK	JC61-00837A	1	O	
46	K2897	CBF-INTERFACE-USB ; ML-6100,-,UL,1800	JC39-00001A	1	O	
47	Z6060	CBF-POWER CORD,2000M ; 250V 7A,MSP-48E,BLK	JC39-10002A	1	O	

8.2 Base-Houshing Assembly

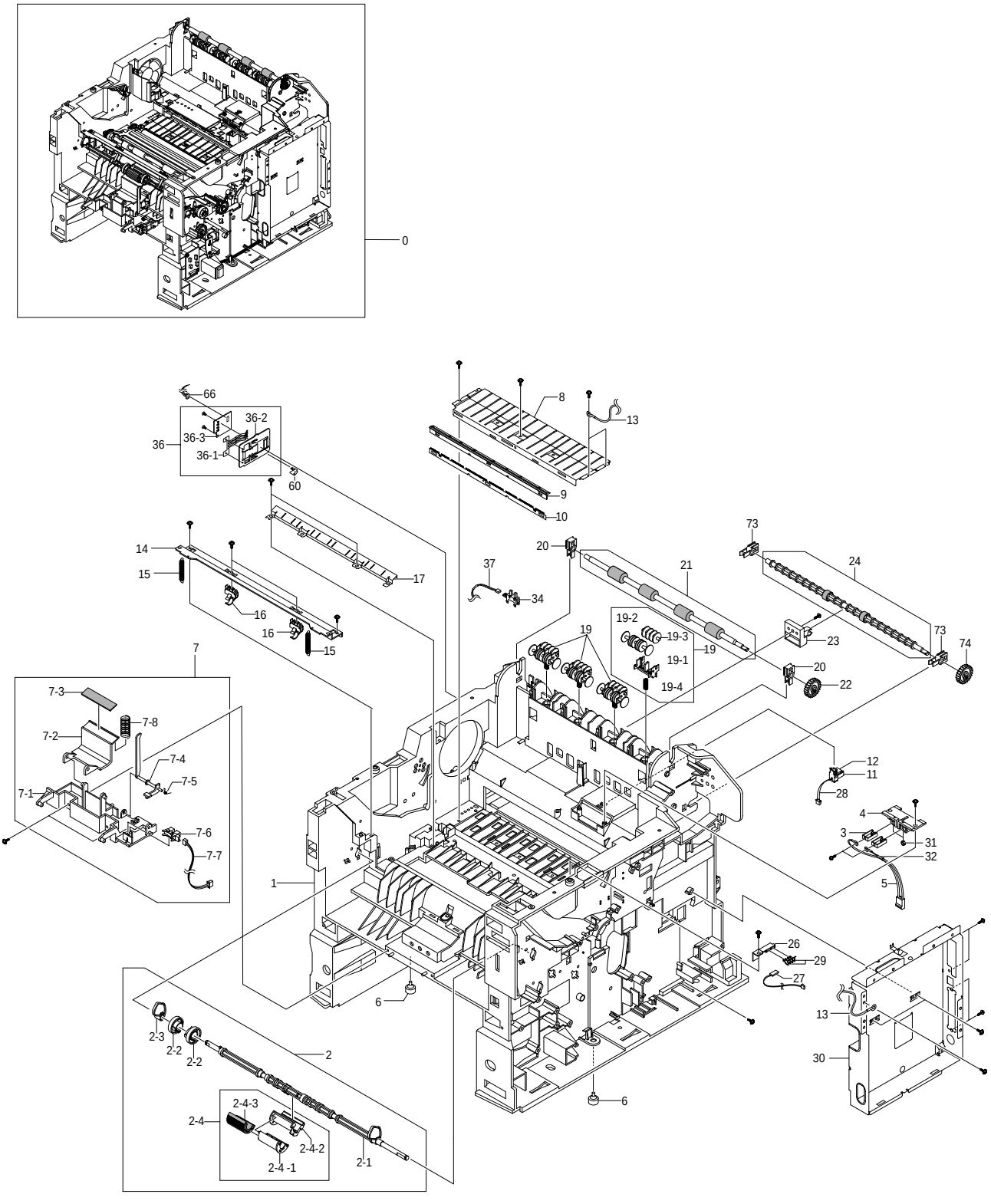


Base-Houshing Assembly Parts List

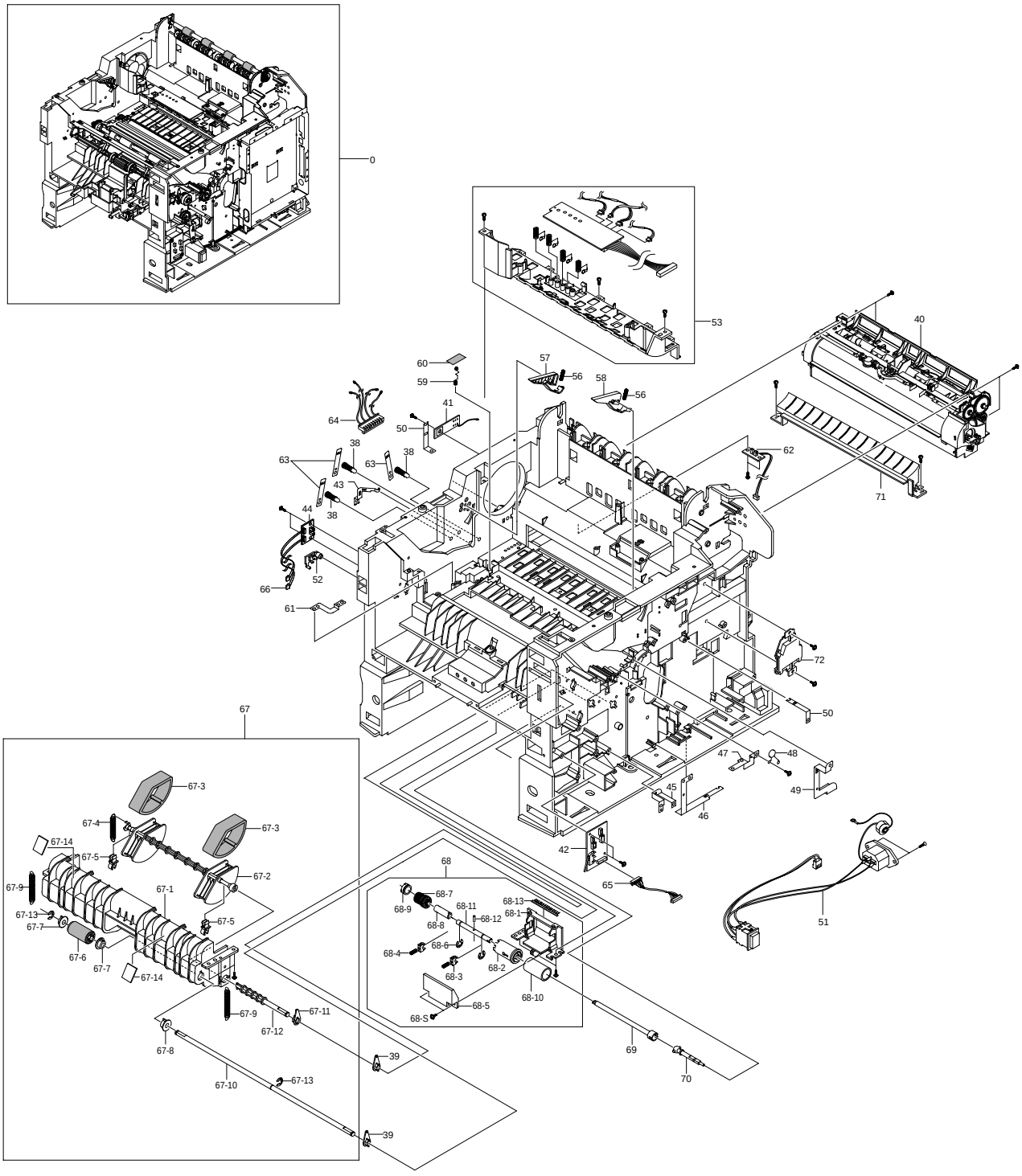
SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	H6001	ELA HOU BASE-HOUSING ; SEC,KOR,22	JC96-02695S	1	X	ML-2550
		ELA HOU BASE-HOUSING ; SEC,KOR,22	JC96-02695X	1	X	ML-2551N
		ELA HOU BASE-HOUSING ; SEC,KOR,22	JC96-02993F	1	X	ML-2555G
1	Z2299	ELA UNIT-COVER TOP ; SEC,KOR,220V	JC96-02696T	1	O	ML-2550
		ELA UNIT-COVER TOP ; SEC,KOR,220V	JC96-02696X	1	O	ML-2551N
		ELA UNIT-COVER TOP ; SEC,KOR,220V	JC96-02696F	1	O	ML-2555G
1-1	Z2168	COVER-M_TOP ; ML-2551N,ABS ,2.5,V0,KOR	JC63-00119R	1	O	ML-2550
		COVER-M_TOP ; ML-2551N,ABS ,2.5,V0,KOR	JC63-00119W	1	O	ML-2551N
		COVER-M_TOP ; ML-2551N,ABS ,2.5,V0,KOR	JC63-00361F	1	O	ML-2555G
1-2	B5010	MEC- BRUSH ANTISTATIC ; ML-6060A,SEC,NTR	JC75-00095A	1	O	
1-3	L4034	LEVER-M_STACKING 25 ; ML-2550,PCABS,0.2,24	JC66-00646B	2	O	
1-4	K2882	BUSH-M-RETAINER ; ML-2060,POM	JC61-00657A	1	O	
1-5	Z4169	SPRING ETC-DUPLEX COVER ; ML-9400W,SUS304W	JC61-00391A	1	O	
1-6	L6053	PMO-STACKER LOCKER ; ML-2060,ABS,0810	JC72-00995A	1	O	
1-7	K4284	WINDOW-M-LCD ; ML-2060,ACRYL,TRANS	JC64-00048A	1	O	
1-8	K0033	KEY-M-BUTTON ; ML-2060,ABS	JC64-00045A	1	O	
1-9	K2377	PBA MAIN-LCD PANEL ; ML-2150,SEC,KOREA,LCD	JC92-01473A	1	X	
1-10	K0037	KEY-M-DUPLEX ; ML-2060,ACRYL,NATURAL	JC64-00044A	1	O	
1-11	K0045	KEY-M-ON LINE ; ML-2060,ACRYL,NATURAL	JC64-00046A	1	O	
1-12	Z2213	COVER-M-OPEN ; ML-2060,ABS,V0	JC63-00116A	1	O	
1-13	S5090	PMO-STACKER_RX ; ML-2150,ABS,LIGHT GRAY	JC72-00973B	1	O	
1-14	H3073	STOPPER-M-HINGE OPEN ; ML-2060,ABS	JC61-00656A	2	O	
1-15	K0049	KEY-M-SAVE MODE ; ML-2060,ACRYL,NATURA	JC64-00047A	1	O	
1-16	Z2496	PBA SUB-COVER OPEN ; ML-2150,SEC,KOREA	JC92-01514A	1	O	
1-17	S3037	CAP-M-SENSOR ; ML-2060,ABS,2.5	JC67-00034A	1	X	
1-18	Z2247	COVER-WINDOW ; ML-2150,PVC FILM,T0.15,78MM	JC63-00256A	1	X	
2	Z2298	ELA UNIT-COVER RIGHT ; ML-2060,SEC,220V	JC96-02697A	1	O	
2-1	Z2224	COVER-M-RIGHT ; ML-2060,ABS	JC63-00115A	1	O	
2-2	B3006	BUTTON-M-POWER ; ML-2060,ABS,V0	JC64-00043A	1	O	
3	Z2421	MEA UNIT-COVER REAR ; ML-2150,SEC,USA	JC97-01743A	1	O	
3-1	Z2220	COVER-M-REAR ; ML-2060,ABS,V0	JC63-00120A	1	O	
3-2	Z5062	PMO-STACKER REAR ; ML-2060,ABS,0810P	JC72-00996A	1	O	
3-3	F6217	SPRING-TS ; SWRS 82A,-,PI0.8,D11.5,-,N11.5	6107-001157	2	O	
3-4	G2059	GUIDE-M-DUPLEX ; ML-2060,PC,BLK	JC61-00658A	2	O	
3-5	K3247	ICT-BRKT REAR COVER ; ML-7000,SPCC,T1.2,ZN	JC70-00007A	1	X	
3-6	S4049	IEX-SHAFT IDLE,F/UP ; ML-5000A,SUS304	JC70-20901A	2	O	
3-7	K3804	PEX-ROLLER F/UP(2) ; ML-5000A,TE	JC72-20902A	2	O	
3-8	D2086	PMO-DUMMY FRAME FUSER ; ML-2060,PET G/F20%	JC72-00999A	1	O	
3-9	E1008	IPR-TENSION PLATE ; ML-2150,SUS304,T0.25	JC70-00465A	1	X	
4	Z2196	COVER-M-LEFT ; ML-2060,ABS,V0	JC63-00117A	1	O	
5	Z2191	COVER-M-FRONT INNER ; ML-2060,ABS,VO	JC63-00118A	1	O	
6	Z2189	COVER-M-FRAME EXIT ; ML-2060,ABS,2.5	JC63-00122A	1	O	

8.3 Frame Assembly (1)



Frame Assembly (2)



Frame Assembly Parts List(1/3)

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	B0075	ELA UNIT-FRAME BASE ; ML-2550,SEC,220V	JC96-02627G	1	O	⚠ 220V
1	B0080	FRAME-M-BASE ; ML-2060,ABS,BLK	JC61-00677A	1	O	
2	P2052	ELA UNIT-PICKUP MP ; ML-2060,SEC,220V	JC96-02681A	1	O	
2-1	P2153	SHAFT-M-PICK UP MP ; ML-2060,PC	JC66-00453A	1	O	
2-2	P2131	PMO-IDLE PICK UP MP ; ML-2060,POM,WHITE	JC72-01003A	2	O	
2-3	P2041	CAM-M-PICK UP MP ; ML-2060,POM,NTR	JC66-00452A	1	O	
2-4	K3174	ELA UNIT-ROLLER P/UP MP ; ML-2060,SEC,220V	JC96-02686A	1	O	
2-4-1	P2062	HOLDER-M-PICKUP MP ; ML-2060,ABS,BLK	JC61-00705A	1	O	
2-4-2	P2064	HOUSING-M-PICK UP MP ; ML-2060,ABS,B	JC61-00685A	1	O	
2-4-3	P2148	RUBBER-PICK UP MP ; ML-2060,NBB,GRAY	JC73-00131A	1	X	
3	K3422	IPR-TERMINAL FU ; ML-165,C5210P,T0.3	JC70-10961A	2	O	
4	H6086	PMO-HOUSING TERMINAL ; ML-165,ABS GF20%,BL	JC72-41010A	1	O	
5	H1085	CBF HARNESS-FUSER ; ML-2150,CBF,UL 3122,2P	JC39-00279A	1	O	
6	F1017	COM,FOOT-RUBBER ; CR70,BLK	JC61-40001A	2	O	
7	P0006	ELA HOU BASE-HOLDER PAD ; ML-2060,SEC,110V	JC96-02675A	1	O	
7-1	P0008	FRAME-M-HOLDER PAD ; ML-2060,ABS,-,HB,BLAC	JC61-00683A	1	O	
7-2	H4029	HOLDER-M-PAD ; ML-2060,ABS,BLK	JC61-00684A	1	O	
7-3	P0034	RPR-FRICTION PAD MP ; ML-2060,NBB,54*10*T1	JC73-00132A	1	O	
7-4	K3818	PMO-ACTUATOR MP ; ML-2060,PC,BLK	JC72-01002A	1	O	
7-5	Z4247	SPRING ETC-REMAIN ; ML-9400W,SUS304WPB,0.4	JC61-00414A	1	O	
7-6	K2483	PHOTO-INTERRUPTER ; TR,-,200mW,DIP-4,ST	0604-001095	1	O	
7-7	H1168	CBF HARNESS-MP EMPTY ; ML-2150,CBF,UL 1061	JC39-00256A	1	O	
7-8	Z4226	SPRING ETC-PAD ; ML-9400W,SUS304WPB,7.55	JC61-00387A	1	O	
8	G2083	GUIDE-P_TRANSFER ; ML-2060,SECC,0.6	JC61-00678A	1	O	
9	K3376	PMO-HOLDER PLATE SAW ; ML-6060A,-,PC,WHT	JC72-40247B	1	X	
10	K3377	IPR-PLATE SAW 2150 ; ML-2150,SUS304CSP	JC70-10232C	1	X	
11	Z0013	PMO-CAP CONNECTOR L ; ML-6060A,PC,VO	JC72-00463A	1	O	
12	Z0014	PMO-CAP CONNECTOR U ; ML-6060A,PC,VO	JC72-00465A	1	O	
13	L5014	CBF HARNESS-OPE ; SF3000,CBF,UL1007,100	JB39-40532A	1	O	
14	G2082	GUIDE-P_REGI UPPER ; ML-2060,SECC,1.2	JC61-00675A	1	O	
15	L4002	SPRING LEVER ; ML-165,SUS304 WPB,PIO.5,D4	JC61-70918A	2	O	
16	H4023	HOLDER-M-BUSHING TX ; ML-2060,POM,BL	JC61-00671A	2	O	
17	G2091	GUIDE-PLATE PAPER ; ML-2060,SECC,T0.6	JC61-00691A	1	O	
19	E4060	MEA RACK-EXIT ROLLER ; ML-1605,SUMSUNG,KOR	JC97-01034A	4	O	
19-1	E4126	PMO-HOLDER EXIT ROLL ; ML-165,PC,BLK,HB	JC72-41006A	1	O	
19-2	K4063	PMO-ROLLER FD F ; ML-165,POM,BLK,HB	JC72-41007A	1	O	
19-3	K4064	PMO-ROLLER FD R ; ML-165,POM,BLK,HB	JC72-41008A	1	O	
19-4	E7004	SPRING-EXIT ROLL FD ; ML-165,SUS304 WPB,PI	JC61-70911A	1	O	
20	H4009	HOLDER-BEARING EXIT/DOWN ; SCX-4216F	JC61-00829A	2	O	
21	E4159	ROLLER-EXIT_F/DOWN ; ML-2150,EPDM	JC66-00668A	1	O	
22	E4041	GEAR-EXIT ; ML-80,POM,BLK	JC66-40209A	1	O	
23	H4022	HOLDER-M-BUSHING EXIT ; ML-2060,POM	JC61-00673A	1	O	

Frame Assembly Parts List(2/3)

SA : Service Available
O : Service available **X** : Service not available

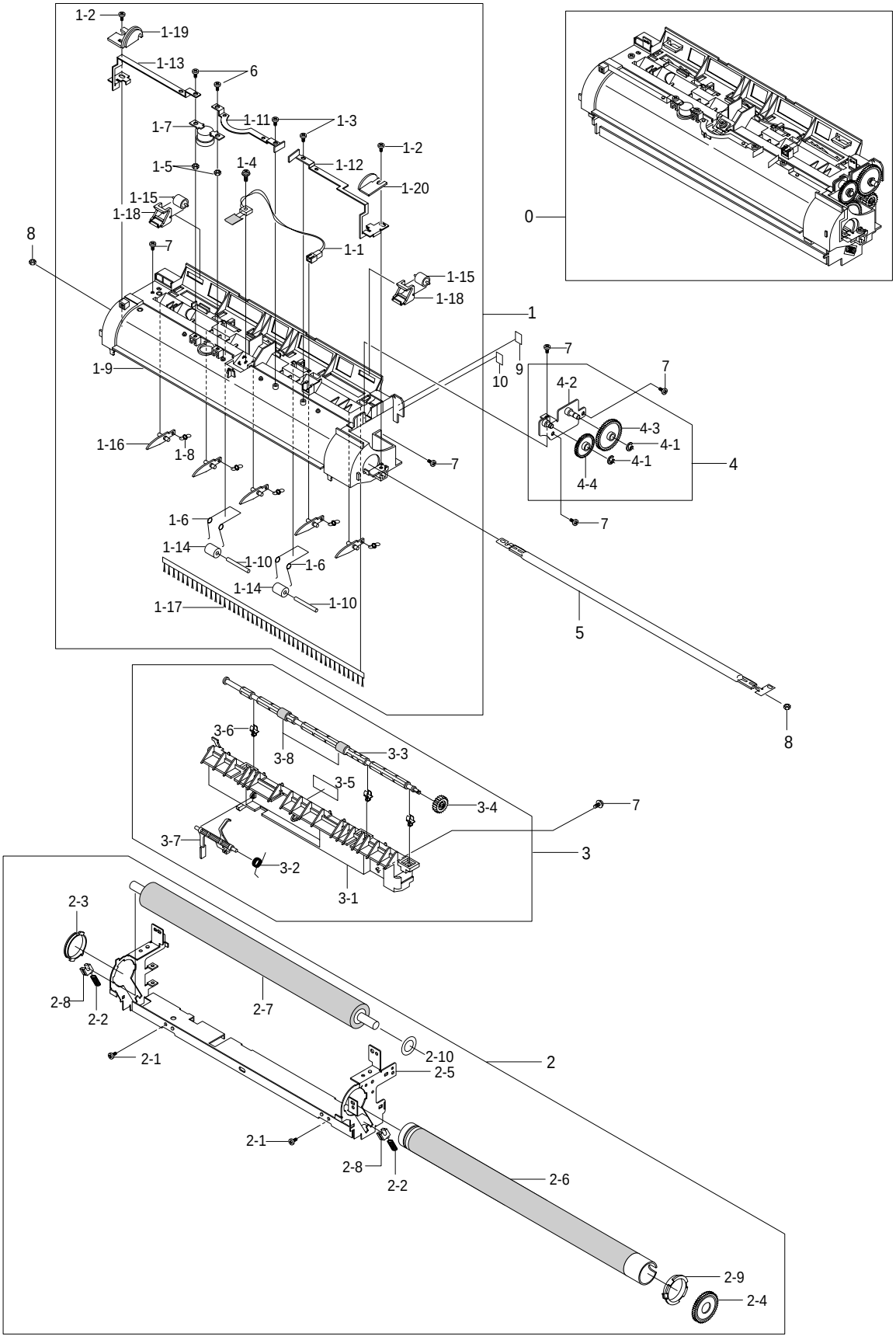
No.	Location	Description	SEC.Code	Q'ty	SA	Remark
24	E4156	RMO-RUBBER EXIT_DUP; ML-2150,EPDM	JC73-40915B	1	O	
25	K3425	IPR-TERMINAL TR HAWK ; ML-6060A,SUS301,T0	JC70-00132A	1	X	
26	C1015	CAP-M-WIRE PTL LOWER ; ML-2060,POM	JC67-00036A	1	O	
27	M0411	PBA SUB-PTL2 ; ML-2150,SEC,KOREA,PTL2	JC92-01516A	1	O	
28	H1267	CBF HARNESS-THRMISTOR ; ML-2150,CBF,UL 106	JC39-00255A	1	O	
29	K4276	TERMINAL-P_PTL ; SUS,T0.2	JC65-00001A	2	O	
30	Z1040	SHIELD-P_CONTROLLER ; ML-2060,SECC,0.8	JC63-00124A	1	O	
31	N1000	NUT-HEX ; 2C,M3,ZPC(YEL),SM20C	6021-000222	2	X	
32	K2756	CABLE_TIE ; DA-80,NONE,T1,W2.5,L80,NTR,NYL	6501-000004	1	X	
34	K2483	PHOTO-INTERRUPTER ; TR,-,200mW,DIP-4,ST	0604-001095	1	O	
36	S3002	ELA HOU-CST SENSOR HAWK16 ; ML-7250,XEROX	JC96-02127A	1	O	
36-1	S3058	IPR-PLATE SENSOR ; ML-7250,SUS301,-,0.2T	JC70-00192A	1	O	
36-2	S3055	BRACKET-SENSOR ; ML-7250,SECC,1.0T	JC70-00195A	1	O	
36-3	M0301	PBA SUB-CASSETTE ; ML-1650,KOREA/EXPORT	JC92-01336A	1	X	
37	H1013	CBF-HARNESS ; ML-80,JUMPER,AWG22,52mm,SILV	JC39-40511A	1	X	
38	K3638	MEA UNIT-TERMINAL:TR ; ML-5000A,SAMSUNG,KO	JC97-01401A	3	O	
39	S4068	PMO-BEARING SHAFT ; ML-2150,POM,BLK,-,DE89	JC72-41191B	5	O	
40	F4068	ELA UNIT-FUSER_25 ; ML-2550,XEROX,USA,220V	JC96-02693D	1	O	⚠ 220V
41	M0442	PBA MAIN-ZENER ; ML-2150,SEC,KOREA,ZENER B	JC92-01488A	1	X	
42	Z0012	PBA SUB-CONNECTOR B'D ; ML-2550,SEC,KOREA	JC92-01530A	1	O	
43	O0020	IPR-P_GROUND OPC;ML-2060,SUS,0.2	JC70-00332A	1	O	
44	M0326	PBA SUB-EMPTY SENSOR ; ML-2150,SEC,KOREA	JC92-01511A	1	O	
45	F6097	IPR-P_GND SOLENOIDE FEED ; ML-2060,SUS	JC70-00336A	1	O	
46	S1052	IPR-P_GROUND SCF MAIN ; ML-2060,SUS,0.2	JC70-00334A	1	O	
47	K3366	IPR-P_GROUND REGI ROLLER ; ML-2060,SUS	JC70-00333A	1	O	
48	K3053	ELA HOU-VARISTOR ; ML-6060,NEC/SEC,110/220	JC96-01772A	1	O	
49	M2124	IPR-P_GROUND MOTOR MAIN2 ; ML-2060,SUS	JC70-00330A	1	O	
50	G2130	IPR-P_GROUND GUIDE TR ; ML-2060,SUS,0.2	JC70-00328A	2	O	
51	H1104	CBF HARNESS-INLET ; ML-2150,CBF,UL 1617	JC39-00246A	1	O	
52	G2096	HINGE-M-FRONT GUIDE, DUP ; ML-2060,POM, HB	JC61-00666A	1	O	
53	L7015	FRAME-M-LSU LOWER ; ML-2060,ABS,BLK	JC61-00676A	1	O	
56	Z4188	SPRING-GUIDE DEVE ; ML-5000A,SUS304 WPB,PI	JC61-70932A	2	O	
57	T2158	PMO-GUIDE DEVE L ; ML-6060A,ABS,BLACK,V0	JC72-00317A	1	O	
58	T2159	PMO-GUIDE DEVE R ; ML-6060A,ABS,BLACK,V0	JC72-00318A	1	O	
59	K4277	TERMINAL-P_TR CARDINAL ; SUS,T0.2	JC65-00005A	1	O	
60	K3319	IPR-GND-P-PAPER_SIZE ; ML-2550,SUS,0.2	JC70-00467A	1	O	
61	P5064	IPR-P_GROUND PLATE PAPER ; ML-2060,SUS	JC70-00339A	1	O	
62	M0330	PBA SUB-EXIT SENSOR ; ML-2150,SEC,KOREA,EX	JC92-01512A	1	O	
63	K4272	TERMINAL-P_HV CARDINAL ; SUS,T0.2	JC65-00006A	3	O	

Frame Assembly Parts List(3/3)

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
64	H1098	CBF HARNESS-HVPS ; ML-2150,CBF,UL 1007,4PI	JC39-00247A	1	O	
65	Z0004	CBF HARNESS-CONNECTOR ; ML-2150,CBF,UL 106	JC39-00259A	1	O	
66	H1242	CBF HARNESS-SENSOR ; ML-2150,CBF,UL 1061,4	JC39-00261A	1	O	
67	P2051	ELA UNIT-PICK UP ; ML-2060,SEC,220V	JC96-02683A	1	O	
67-1	P2054	FRAME-M-PICKUP ; ML-2060,PC,BLACK	JC61-00641A	1	O	
67-2	P2068	HOUSING-M-PICKUP ; ML-2060,ABS,BLK	JC61-00636A	1	O	
67-3	P2148	RUBBER-PICK UP ; ML-2060,PNR,30,GRAY	JC73-00127A	2	O	
67-4	E5025	SPRING-EXTENSION ; ML-5000A,SUS304WPB,PI0	JC61-70950A	1	O	
67-5	F6161	PMO-BUSHING FEED ; ML-1710,DELRIN8903,WHIT	JC72-00382B	2	O	
67-6	F6089	HOUSING-M-FEED ; ML-2060,ABS,BLK,V0	JC61-00637A	1	O	
67-7	F6207	RUBBER-FEED ; ML-2060,PNR,30,GRAY,SE	JC73-00128A	1	X	
67-8	P2038	BEARING-PICK UP ; ML-80,POM	JC66-10202A	3	O	
67-9	Z4203	SPRING-KNOCK UP MP ; ML-165,SUS304 WPB,PI0	JC61-70913A	2	O	
67-10	F6208	SHAFT-FEED, DUP ; ML-2060,SUM24L,61,4.0	JC66-00445A	1	X	
67-11	S4068	PMO-BEARING SHAFT ; ML-2150,POM,BLK,DE89	JC72-41191B	1	O	
67-12	P2153	SHAFT-M-PICK UP MP ; ML-2060,PC	JC66-00453A	1	O	
67-14	P2161	SHEET-COVER PICKUP ; ML-2550,PVC,T0.2	JC63-00293A	2	O	
68	K3172	ELA UNIT-RETARD ; ML-2060,SEC,220V	JC96-02682A	1	O	
68-1	F2120	FRAME-M-RETARD ; ML-2060,PC,BLACK	JC61-00640A	1	O	
68-2	H6035	HOUSING-M-RETARD ; ML-2060,ABS,BLK	JC61-00635A	1	O	
68-3	K2883	BUSH-M-RETARD ; ML-2060,POM(M90-44)	JC61-00652A	2	O	
68-4	Z4226	SPRING ETC-PAD ; ML-9400W,SUS304WPB,7.55	JC61-00387A	2	O	
68-5	H4033	HOLDER-M-RETARD ; ML-2060,ABS,BLK,V0	JC61-00638A	1	O	
68-7	K2701	SPRING-TS ; SUS304,PI0.45,D3.85,L20,W1	6107-001159	1	O	
68-8	K4020	PMO-HUB IN RETARD ; ML-2060,POM,BLK,M90	JC72-00994A	1	O	
68-9	K4021	PMO-HUB OUT RETARD ; ML-2060,POM,BLK,M90	JC72-00993A	1	O	
68-10	K4024	RUBBER-RETARD ; ML-2060,PNR,30,GRAY	JC73-00129A	1	X	
68-11	S4130	SHAFT-RETARD ; ML-2060,SUM 24L,60	JC66-00590A	1	O	
68-12	S4107	SHAFT-HUB IN ; ML-2060,SUM 24L,10,2	JC66-00591A	1	O	
68-13	B5010	MEC- BRUSH ANTISTATIC ; ML-6060A,SEC,NTR	JC75-00095A	1	O	
69	S4116	SHAFT-M-COUPLING RETARD ; ML-2060,PC+GF20%	JC66-00439A	1	O	
70	S4120	SHAFT-M-GEAR RETARD ; ML-2060,PC+GF20%	JC66-00438A	1	O	
71	G2048	GUIDE-M_FRONT ; ML-2150,PET+GF30%+MD	JC61-00801A	1	O	
72	F2122	FRAME-P-FUSER ; ML-2060,SECC T1.2	JC61-00621A	1	X	
73	T2017	BUSH-M-EXIT ; ML-2550,POM,7,7,WHITE	JC61-00845A	2	X	
74	G0331	GEAR-M-EXIT Z17 ; ML-2550,M90-44,1.0,17	JC66-00674A	1	O	

8.4 Fuser Assembly



Fuser Unit Assembly Parts List(1/2)

SA : Service Available
O : Service available **X** : Service not available

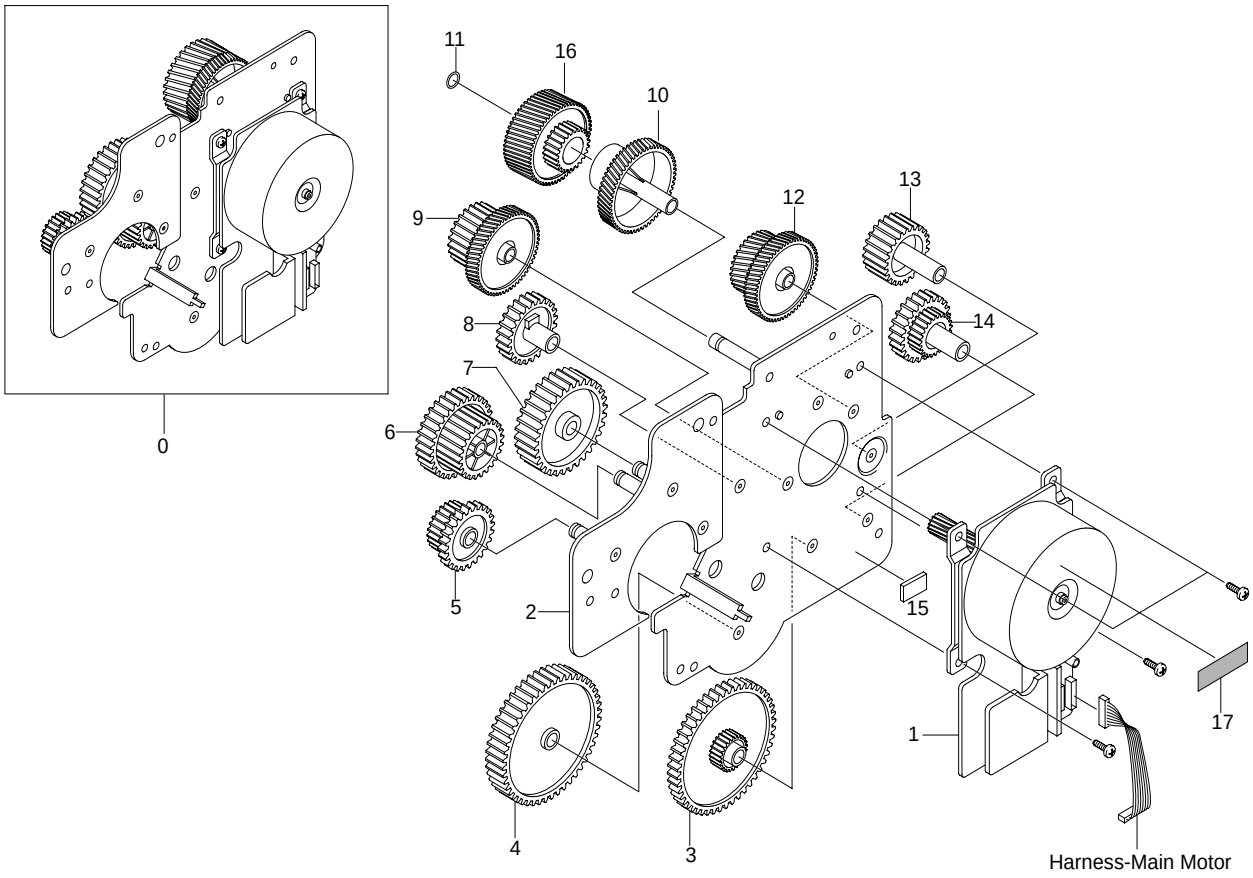
No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	F4068	ELA UNIT-FUSER_25 ; ML-2550,XEROX,USA,220V	JC96-02693D	1	O	⚠ 220V
1	W3182	ELA UNIT-UPPER FUSER ; ML-2150,SEC,USA	JC96-02694A	1	X	
1-1	F4127	THERMISTOR-NTC ; 7KOHM,-,3370K,0.3MW/C	1404-001305	1	O	
1-2	S2003	SCREW-ASSY MACH ; WSP,PH,+,M3,10,ZPC(YEL)	6006-001193	2	X	
1-3	N1000	NUT-HEX ; 2C,M3,ZPC(YEL),SM20C	6021-000222	2	O	
1-5	Z4107	SPRING-TS ; SUS304,-,PI0.6,D3.6,L22,-,W20	6107-001156	2	O	
1-7	K4279	THERMOSTAT-150 ; ML-1510,-,125/250V,15/7.5	JC47-00005A	1	O	
1-8	Z4254	SPRING-SAPERATION ; ML-165,SUS304 WPB,PI0	JC61-70909A	5	O	
1-9	Z2194	COVER-M-FUSER ; ML-2060,PET+GF30%+MD	JC63-00110A	1	O	
1-10	S4049	IEX-SHAFT IDLE,F/UP ; ML-5000A,SUS304,PI1	JC70-20901A	2	O	
1-11	E0001	ELECTRODE-P-FU_M ; ML-2060,T0.6,6,L72,C521	JC71-00039A	1	O	
1-12	E0002	ELECTRODE-P-FU_R ; ML-2060,T0.6,6,L72,C521	JC71-00040A	1	O	
1-13	E0000	ELECTRODE-P_FU_L ; ML-2060,T0.6,6,L90,C521	JC71-00041A	1	O	
1-14	K3804	PEX-ROLLER F/UP(2) ; ML-5000A,TE	JC72-20902A	2	O	
1-15	K4068	PMO-ROLLER UPPER DP ; ML-165,POM,WHT,HB	JC72-40981A	2	O	
1-16	C7003	PMO-GUIDE CLAW ; ML-165,PEEK,BLK	JC72-41012A	5	O	
1-17	B5010	MEC- BRUSH ANTISTATIC ; ML-6060A,SEC,NTR	JC75-00095A	1	O	
1-18	H4027	HOLDER-M-IDLE ROLLER;ML-2150,PC,BL	JC61-00785A	2	O	
1-19	C1015	CAP-M-FUSER_L ; ML-2550,OFL4036,T1.5,B	JC67-00056A	1	X	
1-20	C1016	CAP-M-FUSER_R ; ML-2550,OFL4036,T1.5	JC67-00057A	1	X	
2	F4020	MEA UNIT-LOWER FUSER ; ML-2150,SEC,USA	JC97-01718A	1	X	
2-2	Z4230	SPRING-PR(7300) ; ML-7300,PIANO WIRE,1.0,6	JC61-00056A	2	O	
2-3	K2881	BUSH-M-HR_R ; ML-2060,PPS,BLK	JC61-00615A	1	O	
2-4	F4084	GEAR-FUSER 7300 ; ML-7300,PPS, OFL4036,1,3	JC66-40913B	1	O	
2-5	F2122	FRAME-P-FUSER ; ML-2060,SECC T1.2	JC61-00621A	1	O	
2-6	H2010	ROLLER-HEAT ; ML-2150,AL PIPE T1.8MM,26MM	JC66-00597A	1	O	
2-7	P6014	ROLLER-PRESSURE ; ML-2150,HTV SP	JC66-00599A	1	O	
2-8	P6004	BEARING-PRESSURE/R ; ML-165,PPS,5,4.8	JC66-10901A	2	O	
2-9	B1019	BEARING-H/R L ; ML-165,PPS(RBA313),ID26.2	JC66-10902A	1	O	
2-10	K2680	SPACER-DEV ; ID6.0,OD19.6,T0.2,NTR,TEFLON	JC60-40902A	2	X	
3	K3570	MEA UNIT-GUIDE REAR ; ML-2150,SEC,USA	JC97-01719A	1	X	
3-1	G2074	GUIDE-M-REAR ; ML-2060,PET+GF30%+MD	JC61-00620A	1	O	
3-2	Z4132	SPRING-ACTUATOR ; ML-165,SWPB,P0.15,D7,L1	JC61-70903A	1	O	
3-3	S4119	SHAFT-M-EXIT_F/UP ; ML-2060,PC	JC66-00402A	1	O	
3-4	E4041	GEAR-EXIT ; ML-80,POM,BLK	JC66-40209A	1	O	
3-5	L0213	LABEL(R)-CAU_HOT_FU ; ML-5000A/XRX,PVC,40X	JC68-30928B	1	X	
3-6	B6027	PMO-BUSHING TX ; ML-6060A,POM,BLK	JC72-00382A	3	X	
3-7	E4093	PMO-ACTUATOR EXIT ; ML-2060,PC,BLK	JC72-00988A	1	O	
3-8	E4158	RMO-RUBBER EXIT_F/UP ; ML-2150,EPDM	JC73-40909B	2	X	

Fuser Unit Assembly Parts List(2/2)

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
4	K3531	MEA UNIT-BRK GEAR FU ; ML-2150,SEC,USA	JC97-01720A	1	X	
4-2	B4024	BRACKET-P-FUSER ; ML-2060,SECC,T1.2	JC61-00617A	1	O	
4-3	G0268	GEAR-IDLE 33 ; ML-2060,M90-44,1.0,33,8,NTR	JC66-00425A	1	O	
4-4	G0269	GEAR-IDLE 23 ; ML-2060,PPS,1.0,23,8,NTR,25	JC66-00426A	1	O	
5	K2297	LAMP-HALOGEN ; 230V,900W,10X284MM	4713-001187	1	O	⚠ 220V
6	S2003	SCREW-ASSY MACH ; WSP,PH,+,M3,10,ZPC(YEL)	6006-001193	2	X	
8	N1000	NUT-HEX ; 2C,M3,ZPC(YEL),SM20C	6021-000222	2	X	
9	L0245	LABEL(R)-HV FUSER ; ML-6060,PVC,-,220V	JC68-00407A	1	X	⚠ 220V
10	L0246	LABEL(R)-FUSER TOUCH ; ML-2550,XEROX,PVC10	JC68-01139A	2	X	

8.5 Main Driver Assembly

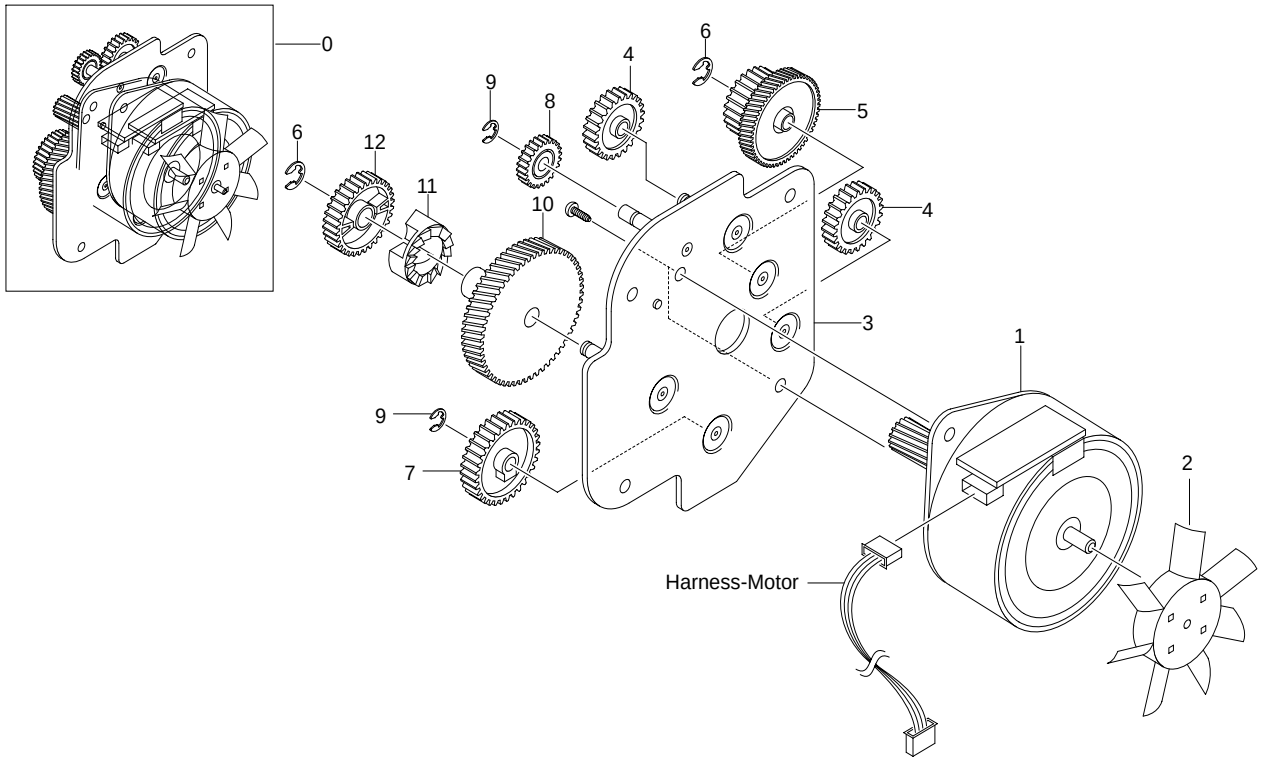


Main Driver Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	M2098	ELA UNIT-MOTOR MAIN CAR 25 ; ML-2550,XEROX	JC96-02725B	1	O	
1	M2140	MOTOR DC-BLDC CARDINAL ; 50M8432030,1.7A	JC31-00024A	1	O	
2	B4029	BRACKET-P-MAIN ; ML-2060,SECC,1.6,163,123	JC61-00622A	1	O	
3	P2057	GEAR-RDCN PICK_UP ; ML-2060,M90-44,0.8,63	JC66-00411A	1	O	
4	P2056	GEAR-PICK_UP DRV ; ML-2060,SW-01,0.8,59,10	JC66-00412A	1	O	
5	G0400	GEAR-RDCN RETARD ; ML-2060,SW-01,0.8,27/19	JC66-00410A	1	O	
6	F6085	GEAR-RDCN FEED ; ML-2060,SW-01,0.8,33/23,1	JC66-00409A	1	O	
7	G0339	GEAR-MP DRV ; ML-2060,M90-44,0.8,45,7.5,NT	JC66-00413A	1	O	
8	G0413	GEAR-REGI IDLE ; ML-2060,M90-44,0.8,29,15E	JC66-00408A	1	O	
9	G0399	GEAR-RDCN REGI ; ML-2060,SW-01,0.5/0.8,59	JC66-00407A	1	O	
10	G0346	GEAR-OPC DRV INNER ; ML-2150,M90-44,0.5,53	JC66-00644A	1	O	
11	W0002	WASHER-PLAIN ; NYLON,CUTTING,ID5,OD9,T0.5	6031-001255	2	O	
12	O0012	GEAR-RDCN OPC ; ML-2060,M90-44,0.5,61/26,1	JC66-00405A	1	O	
13	D3019	GEAR-DUPLEX IDLE ; ML-2060,M90-44,1.0,23,3	JC66-00415A	1	O	
14	D3022	GEAR-RDCN DUPLEX ; ML-2060,SW-01,0.8/1.0,1	JC66-00414A	1	O	
15	F1017	COM,FOOT-RUBBER ; CR70,BLK	JC61-40001A	1	O	
16	G0348	GEAR-OPC DRV OUTER ; ML-2150,M90-44,0.8,31	JC66-00645A	1	O	
17	L0028	LABEL(P)-CAUTION MOTOR ; SF-5100,PVC,12*29	JC68-00261A	1	X	

8.6 Exit Driver Assembly

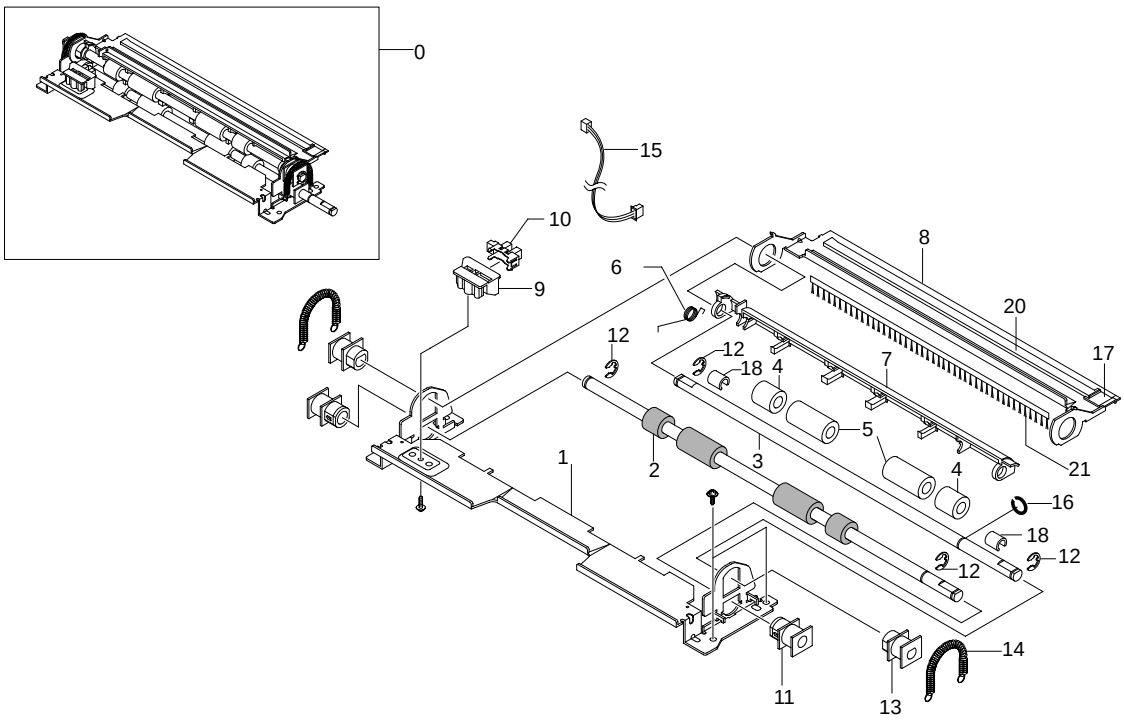


Exit Driver Unit **Parts List**

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	M2097	ELA UNIT-MOTOR EXIT CARDINAL2 ; ML-2550,XE	JC96-02857A	1	O	
1	M2153	MOTOR STEP-CARDINAL 2;M49SP-2NK,ML-2550	JC31-00028C	1	O	
2	K4023	PMO-IMPELLER_DRV ; ML-6200,-,PC,BLK,V0	JC72-00825A	1	X	
3	B4022	BRACKET-P-EXIT ; ML-2060,SECC,1.2,77,85	JC61-00623A	1	O	
4	G0198	GEAR-DP,IDLE ; ML-165,POM(NW-02),WHT,M1,Z2	JC66-40911A	2	O	
5	E4047	GEAR-RDCN EXIT ; ML-2060,M90-44,0.5/1.0,53	JC66-00419A	1	O	
7	F4087	GEAR-FUSER IDLE ; ML-2060,SW-01,1.0,29,8,N	JC66-00418A	1	O	
8	E4045	GEAR-EXIT/U,ID ; ML-1605,POM,BLK	JC66-40211B	1	O	
10	F4098	GEAR-RDCN FUSER IN ; ML-2060,M90-44,0.5,79	JC66-00416A	1	O	
11	C9033	GEAR-HUB CLUTCH ; SCX-5100,POM,M0.8,Z13	JC66-00340A	1	O	
12	F4099	GEAR-RDCN FUSER OUT ; ML-2060,M90-44,1.0,2	JC66-00417A	1	O	

8.7 Regi Assembly

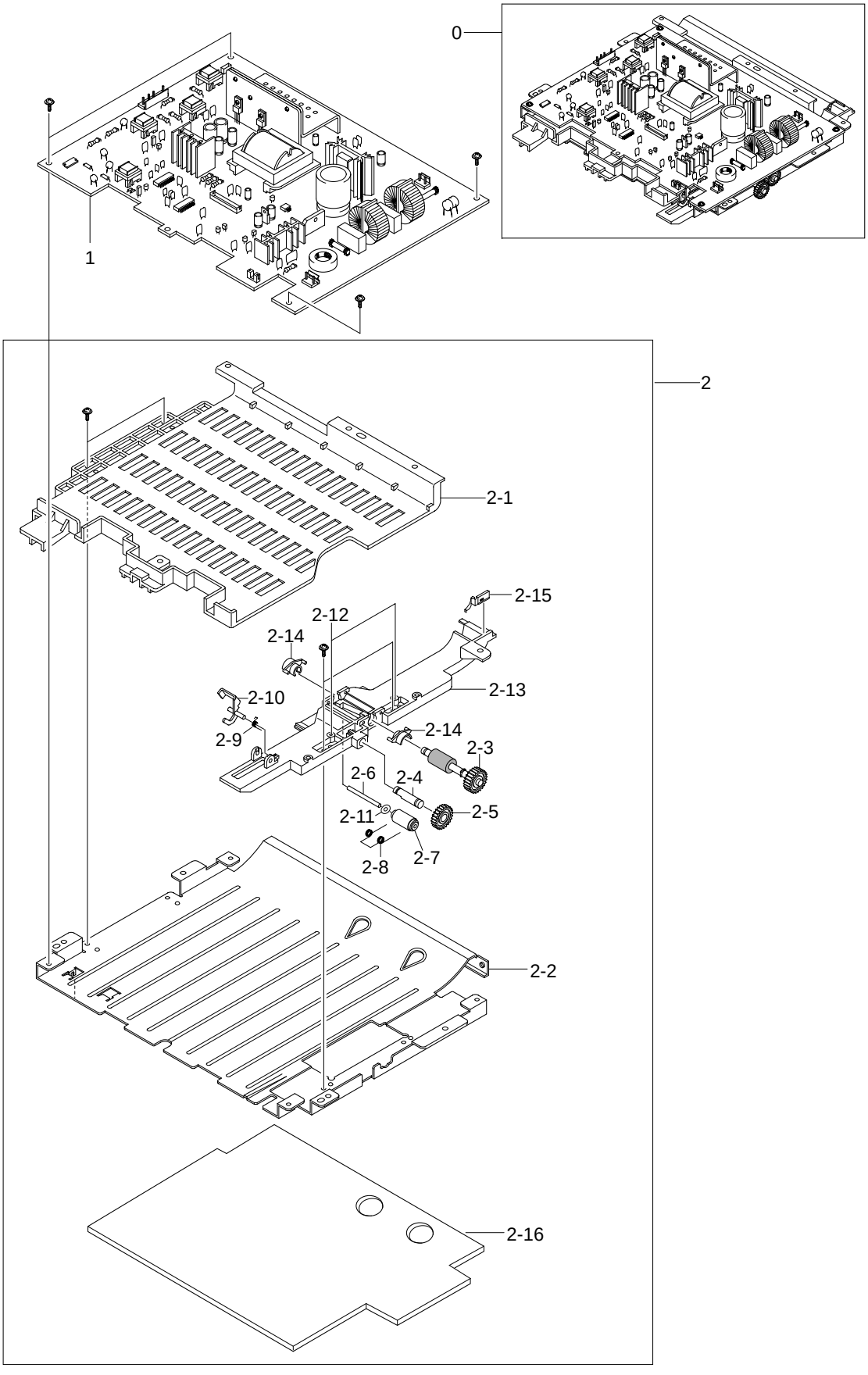


Regi Unit **Parts List**

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	K3171	ELA UNIT-REGI ; ML-2060A,SEC,220V	JC96-02626A	1	O	
1	G2080	GUIDE-P_REGI LOWER ; ML-2060,SECC,1.2	JC61-00674A	1	O	
2	K4228	ROLLER-REGI LOWER L ; ML-2060,CR,13.6,BL	JC66-00450A	1	X	
3	S4129	SHAFT-REGI UPPER ; ML-2060,SUM,6	JC66-00446A	1	X	
4	K4220	ROLLER-M_REGI IDLE S25 ; ML-2150,POM,11.9	JC66-00648A	2	O	
5	K4221	ROLLER-M_REGI IDLE L25 ; ML-2150,POM,12.1	JC66-00647A	2	O	
6	Z4109	SPRING-TS ; SUS304,-,PI0.45,D5.45,L19.8	6107-001160	1	O	
7	S6005	PMO-ACTUATOR REGISHUTTER ; ML-2060,PET G/F	JC72-00998A	1	O	
8	G2081	GUIDE-P_REGI PLATE ; ML-2060,SECC,1.2	JC61-00670A	1	O	
9	H4035	HOLDER-M-SENSOR ; ML-2060,HIPS,BLK	JC61-00672A	1	O	
10	K2483	PHOTO-INTERRUPTER ; TR,90%,150mW,DIP-4,BK	0604-001095	1	O	
11	K2884	BUSH-M-ROLLER REGI L ; ML-2060,POM(M90-44)	JC61-00668A	2	O	
13	K2885	BUSH-M-ROLLER REGI U ; ML-2060,POM(M90-44)	JC61-00669A	2	O	
14	Z4110	SPRING-ES ; SWP-WPB,-,PI0.55,-,L25,N29	6107-001155	2	O	
15	H1168	CBF HARNESS-MP EMPTY ; ML-2150,CBF,UL 1061	JC39-00256A	1	O	
16	W0002	WASHER-PLAIN ; NYLON,CUTTING,ID5,OD9,T0.5	6031-001255	1	O	
17	C1016	CAP-M-WIRE PTL UPPER ; ML-2060,POM,B	JC67-00035A	1	O	
18	A0003	CAP-M_BUSHING ACTUATOR ; ML-2060,POM	JC67-00047A	2	O	
19	C1017	CAP-P_BUSHING REGI LOWER;ML-2060,SUS,T0	JC67-00038A	2	O	
20	M0248	PBA MAIN-PTL1 ; ML-2150,SEC,KOREA,PTL1 B'D	JC92-01475A	1	X	
21	B5010	MEC- BRUSH ANTISTATIC ; ML-6060A,SEC,NTR	JC75-00095A	1	O	

8.8 SMPS Assembly

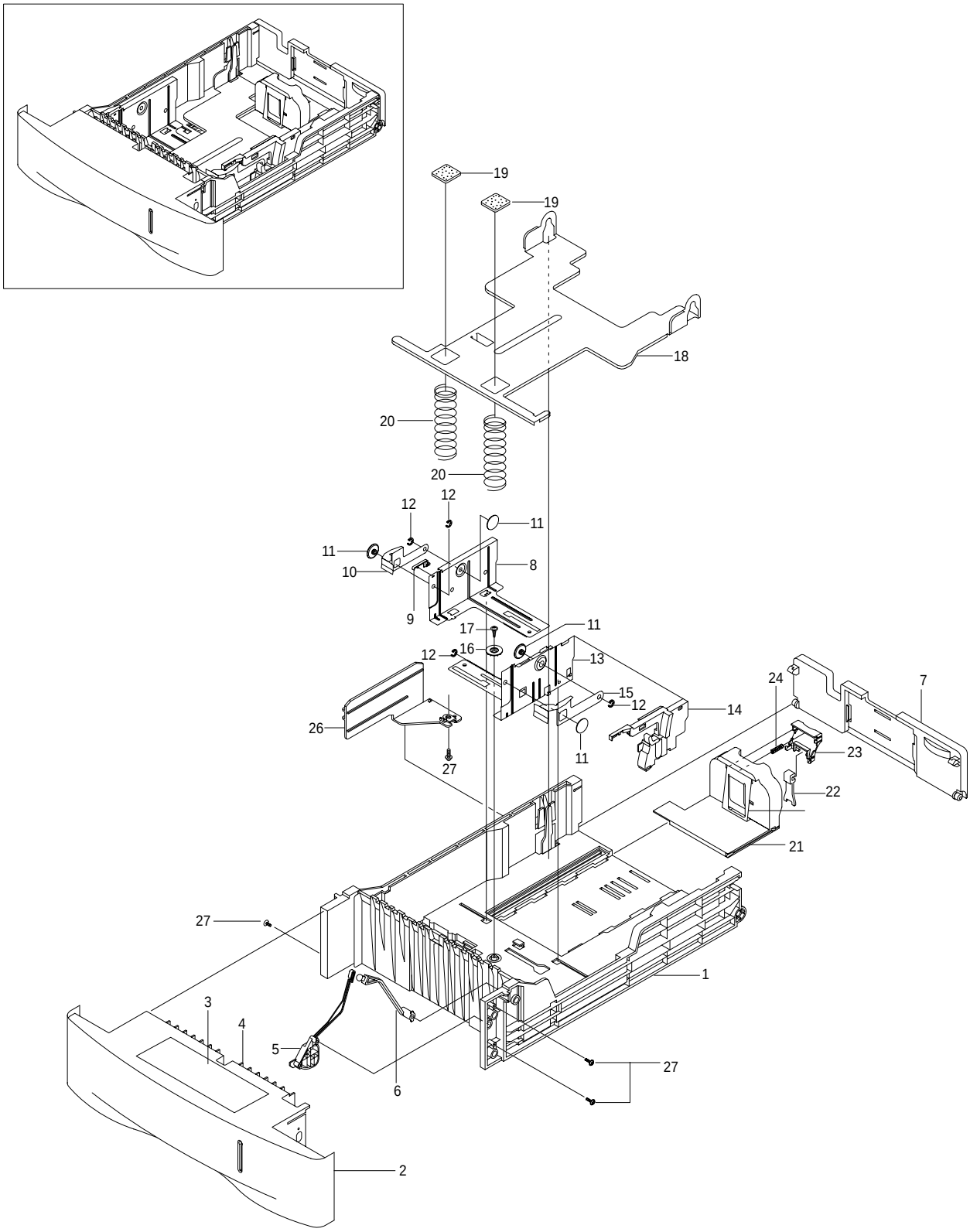


SMPS Unit Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	S7016	ELA HOU-SMPS_HVPS_V2(220V) ; ML-2550,SEC	JC96-02777B	1	O	⚠ 220V
1	S7050	SMPS-V2_HVPS ; ML-2150,CARDINAL-V2,AC/DC	JC44-00053A	1	O	⚠ 220V
2	D3026	MEA UNIT-DUPLEX ; ML-2550,XEROX,USA,DUPLEX	JC97-01714B	1	O	
2-1	G2066	GUIDE-M-LEFT, DUP ; ML-2060,HIPS, HB,2.0,4	JC61-00664A	1	O	
2-2	G2084	GUIDE-P-BOTTOM, DUP ; ML-2060,SECC,0.8,248	JC61-00661A	1	O	
2-3	F6137	MEA UNIT-ROLLER FEED, DUP ; ML-2150,SEC	JC97-01713A	1	X	
2-4	G0456	ICT-STUD DRV GEAR, DUP ; ML-2060,SWCH10181	JC70-00327A	1	O	
2-5	G0198	GEAR-DP,IDLE ; ML-165,POM(NW-02),WHT,M1,Z2	JC66-40911A	1	O	
2-6	S4108	SHAFT-IDLE ROLL, DUP ; ML-2060,SUM24L,24,2	JC66-00444A	1	O	
2-7	K4223	ROLLER-M-IDLE, DUP ; ML-2060,POM, SW01,8.0	JC66-00442A	1	O	
2-8	K2702	SPRING-TS ; SUS304-WPB,-,PI0.4,D6.7	6107-001158	1	O	
2-9	Z4110	SPRING-EMPTY ; ML-6000,SUS304-WPB,PI0.25	JC61-70965A	1	O	
2-10	E6155	PMO-ACTUATOR FEED, DUP ; ML-2060,POM,BLK	JC72-00997A	1	O	
2-11	W0003	PCT-SILP WASHER ; SRP-350,PET,T0.5	JK72-00058A	1	X	
2-12	G2098	ICT-STUD PAPER GUIDE, DP ; ML-2150,SUS 303	JC70-00457A	2	O	
2-13	G2075	GUIDE-M-RIGHT, DUP ; ML-2060,ABS, V0,2.0,5	JC61-00662A	1	O	
2-14	F6042	BUSH-M-FEED, DUP ; ML-2060,POM, SW01,4.1,7	JC61-00665A	2	O	
2-15	K3929	GUIDE-P_SKEW, DUP ; ML-2150,SUS304,0.15,13	JC61-00787A	1	X	
2-16	S5071	SHEET-GUIDE BOTTOM ; ML-2550,WEBSULER,T5	JC63-00297A	1	O	

8.9 Cassette Assembly

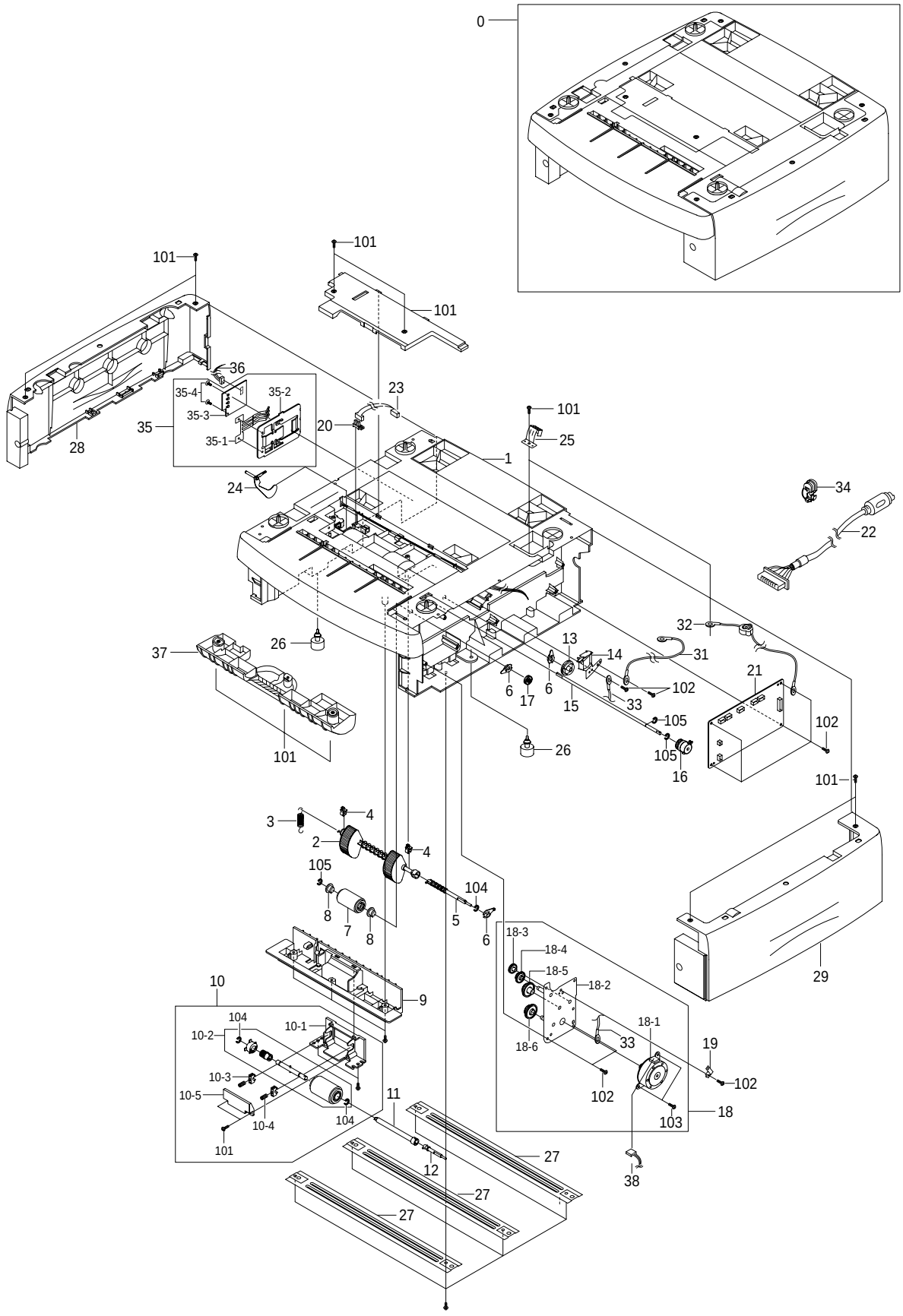


Cassette Assembly Parts List

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	K3096	ELA UNIT-CASSETTE(550) ; ML-2150,SEC,110	JC96-02845B	1	O	
1	F2112	FRAME-M-CASSETTE ; ML-2060,HIPS,HB,BLACK	JC61-00642A	1	O	
2	G2062	GUIDE-M-HANDLE ; ML-2060,ABS,V0,IVOR	JC61-00655A	1	O	
3	L0209	LABEL(R)-CASSETTE ; ML-2060,SAMSUNG,TETRON	JC68-01031A	1	X	
4	G2064	GUIDE-M-INNER CST ; ML-2060,HIPS,HB	JC61-00704A	1	O	
5	H4028	HOLDER-M-INDICATOR ; ML-2060,ABS,BLK	JC61-00639A	1	O	
6	K3263	INDICATOR-M-EMPTY ; ML-2060,HIPS,-,RED,HB	JC64-00041A	1	O	
7	E5005	GUIDE-M-EXTENSION CST ; ML-2060,HIPS,HB	JC61-00644A	1	O	
8	G2264	GUIDE-P-SIDE,L ; ML-2060,SECC,T1.2	JC61-00647A	1	X	
9	C1014	CAP-M-GUIDE SIDE,L ; ML-2060,ABS,BLK	JC67-00037A	1	O	
10	F0004	IPR-P-FINGER LEFT ; ML-2060,SPCC,T1.2	JC70-00325A	1	O	
11	F0001	BUSH-M-FINGER,F ; ML-2060,POM(M90-44)	JC61-00653A	4	O	
12	W0002	WASHER-PLAIN ; NYLON,CUTTING,ID5,OD9,T0.5	6031-001255	4	O	
13	G2265	GUIDE-P-SIDE,R ; ML-2060,SECC,T1.2	JC61-00649A	1	X	
14	G2076	GUIDE-M-SIDE LOCK ; ML-2060,ABS,HB	JC61-00645A	1	O	
15	F0005	IPR-P-FINGER RIGHT ; ML-2060,SPCC,T1.2	JC70-00326A	1	O	
16	G0369	GEAR-PINION ; SF4000,POM,WHT,M1,Z16	JG66-40003A	1	O	
18	P5146	PLATE-P-KNOCK_UP ; ML-2060,SECC,T1.0,243	JC61-00651A	1	X	
19	K4243	RPR-PAD CST ; ML-165,CORK,25.8*24.6,NTR	JC73-10910A	2	O	
21	G2073	GUIDE-M-REAR ; ML-2060,HIPS,HB,IVORY	JC61-00646A	1	O	
22	G2068	GUIDE-M-LOCK A ; ML-2150,ABS,HB,C750	JC61-00267B	1	O	
23	K3429	KNOB-M-REAR ; ML-2060,ABS,IVORY	JC64-00042A	1	O	
24	Z4247	SPRING ETC-REMAIN ; ML-9400W,SUS304WPB,0.4	JC61-00414A	1	O	
25	G2088	GUIDE-P-REAR PAPER CST ; ML-2060,SUS-301,0	JC61-00751A	1	O	
26	G2071	GUIDE-M-PAPER SIZE ; ML-2060,POM,WHT	JC61-00648A	1	O	
28	K4264	STOPPER-GUIDE_SIDE ; ML-2150,CR V0,10.0	JC61-00842A	4	O	

8.10 SCF Assembly



SCF Assembly Parts List(1/2)

SA : Service Available
O : Service available **X** : Service not available

No.	Location	Description	SEC.Code	Q'ty	SA	Remark
0	L1012	ELA UNIT-SCF ; ML-2150	JC96-02842B	1	X	
1	S1031	FRAME-M-SCF ; ML-2060,	JC61-00643A	1	O	
2	P2051	MEA UNIT-PICK UP ASS'Y	JC96-02683A	1	O	
2-1	P2068	HOUSING-M-PICKUP ; ML-	JC61-00636A	1	O	
2-2	P2148	RUBBER-PICK UP ; ML-21	JC73-00127A	2	O	
3	E5025	SPRING ETC-EXTENSION	JC61-70950A	1	O	
4	F6161	PMO-BUSHING FEED ; ML-	JC72-00382B	2	O	
5	P2153	SHAFT-M-PICK UP ; ML-2	JC66-00440A	1	O	
6	S4068	PMO-BEARING SHAFT ; ML	JC72-41191B	4	O	
7	F6089	HOUSING-M-FEED ; ML-21	JC61-00637A	1	O	
8	P2038	BEARING-PICK UP ; ML-8	JC66-10202A	2	O	
9	G2065	GUIDE-M-INNER,SCF ; ML	JC61-00650A	1	O	
10	K3172	ELA UNIT-RETARD ; ML-2	JC96-02682A	1	O	
11	S4116	SHAFT-M-COUPLING RET	JC66-00441A	1	O	
12	S4120	SHAFT-M-GEAR RETARD;	JC66-00438A	1	O	
13	P2059	GEAR-SCF PICK_UP CAM	JC66-00534A	1	O	
14	S8014	SOLENOID-MP;DLH-34L0	JC33-00013A	1	O	
15	F6211	SHAFT-FEED SCF ; ML-20	JC66-00593A	1	O	
16	C9049	MEP-CLUTCH FEED SCF;	JC47-00009B	1	O	
17	G0415	GEAR-REGI Z25 ; ML-215	JC66-00420A	1	O	
18	M2101	ELA UNIT-MOTOR SCF ; M	JC96-02858A	1	O	
18-1	M2165	MOTOR STEP-SCF ; -,ML-	JC31-00005E	1	O	
18-2	S1009	BRACKET-P-SCF ; ML-206	JC61-00624A	1	O	
18-3	G0413	GEAR-REGI IDLE ; ML-21	JC66-00408A	1	O	
18-4	G0400	GEAR-RDCN RETARD ; ML-	JC66-00410A	1	O	
18-5	P2060	GEAR-SCF RDCN PICK_U	JC66-00428A	1	O	
18-6	F6087	GEAR-SCF RDCN FEED ; M	JC66-00427A	1	O	
19	F6094	IPR-GROUND SPRING_ F	JC70-00464A	1	O	
20	W3026	PHOTO-INTERRUPTER ; TR	0604-001095	1	O	
21	M0416	PBA SUB-SCF ; ML-2060,	JC92-01436A	1	O	
22	H1227	CBF HARNESS-SCF ; ML-2	JC39-00248A	1	O	
23	H1230	CBF HARNESS-SCF EMPT	JC39-00250A	1	O	
24	S1071	PMO-ACTUATOR EMPTY,S	JC72-00992A	1	O	
25	K3332	IPR-GROUND TOP ; ML-60	JC70-11028A	1	O	
26	F1013	FOOT-ML80;ML-80,CR70	JC61-40001A	2	O	
27	K2861	BAR-P_CROSS BOTTOM ; M	JC71-00042A	3	O	
28	S1011	COVER-M-LEFT SCF ; ML-	JC63-00112A	1	O	
29	S1013	COVER-M-RIGHT SCF ; ML	JC63-00113A	1	O	
30	D2010	COVER-M-DUMMY SCF ; ML	JC63-00114A	1	O	
31	H1231	CBF HARNESS-SCF GND;	JC39-40608A	1	O	
32	L5004	CBF HARNESS-LIU GND;	JB39-00103A	1	O	
33	H1182	CBF HARNESS-OPE ; SF30	JB39-40532A	1	O	
34	C0029	BUSH-CABLE ; ML-2150,N	JC61-00804A	1	O	

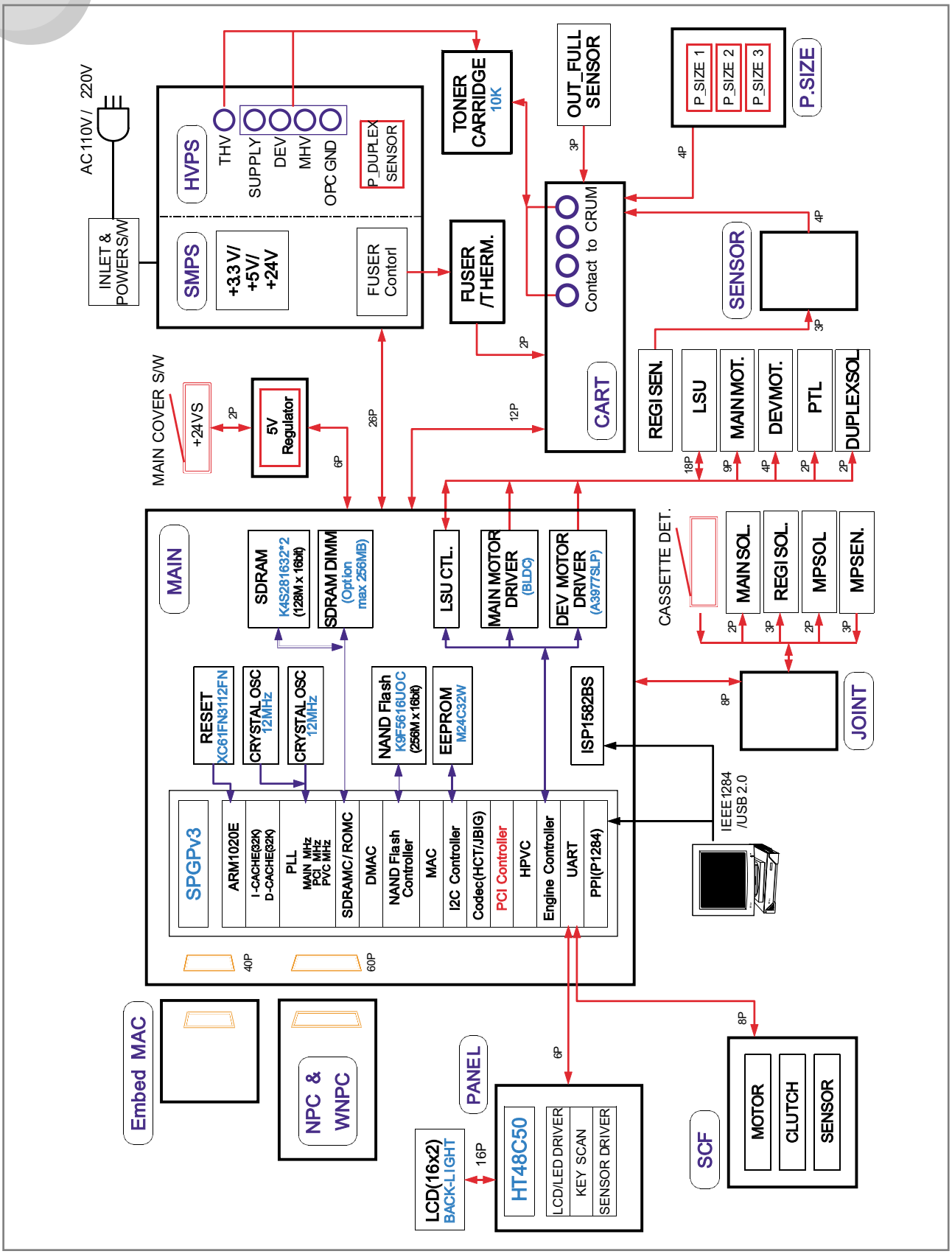
SCF Assembly Parts List(2/2)

SA : Service Available
O : Service available **X** : Service not available

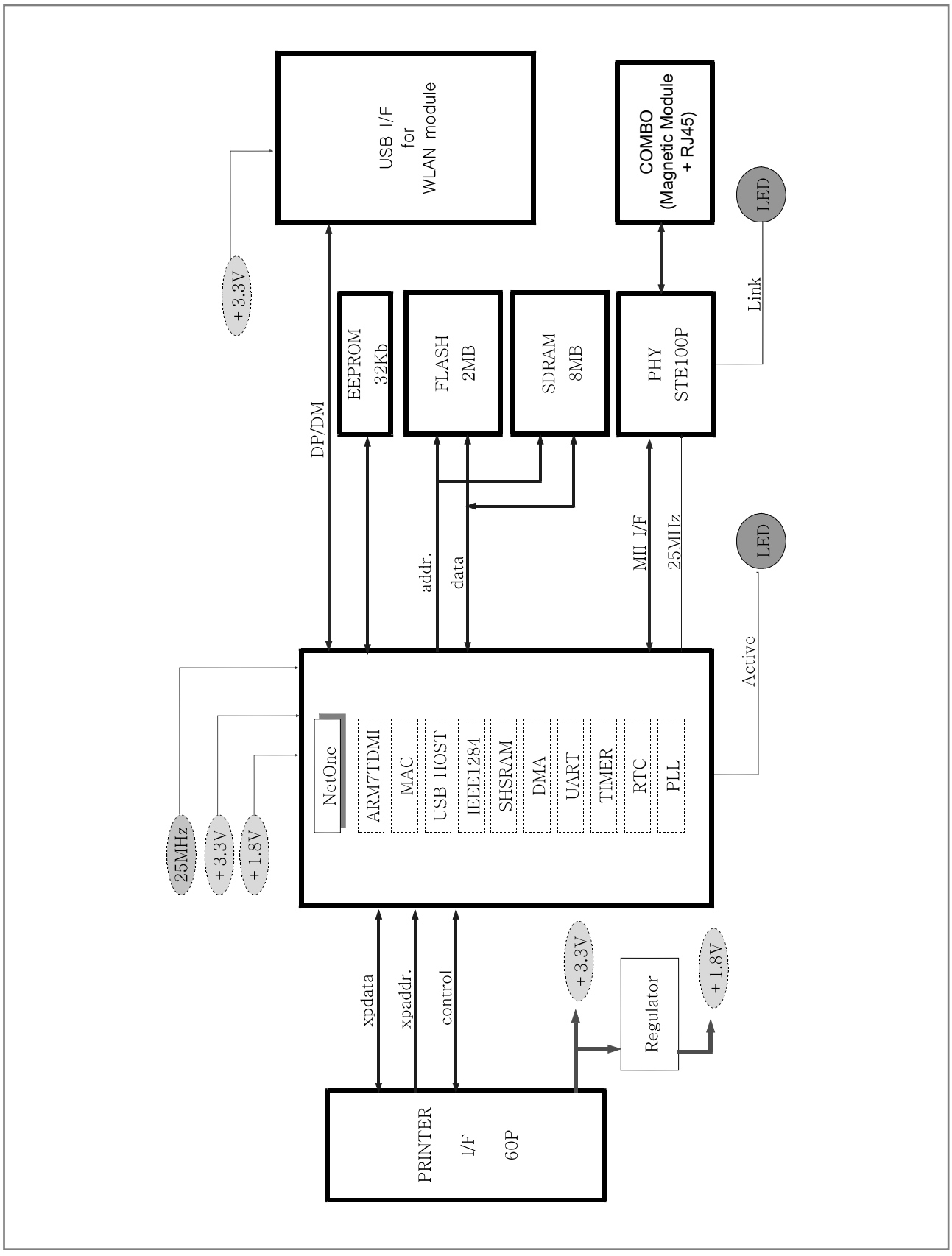
No.	Location	Description	SEC.Code	Q'ty	SA	Remark
35	K2953	ELA HOU-CST SENSOR H	JC96-02127A	1	O	
35-1	S3058	IPR-PLATE SENSOR ; ML-	JC70-00192A	1	O	
35-2	S3055	IPR-BRACKET SENSOR ; M	JC70-00195A	1	O	
35-3	M0301	PBA SUB-CASSETTE ; ML-	JC92-01336A	1	X	
36	H1234	CBF HARNESS-SCF PAPE	JC39-00297A	1	O	
37	M2053	CBF HARNESS-MOTOR ; ML	JC39-00157A	1	O	
38	G2069	GUIDE-M-PAPER PATH ;M	JC61-00803A	1	O	

9. Block Diagram

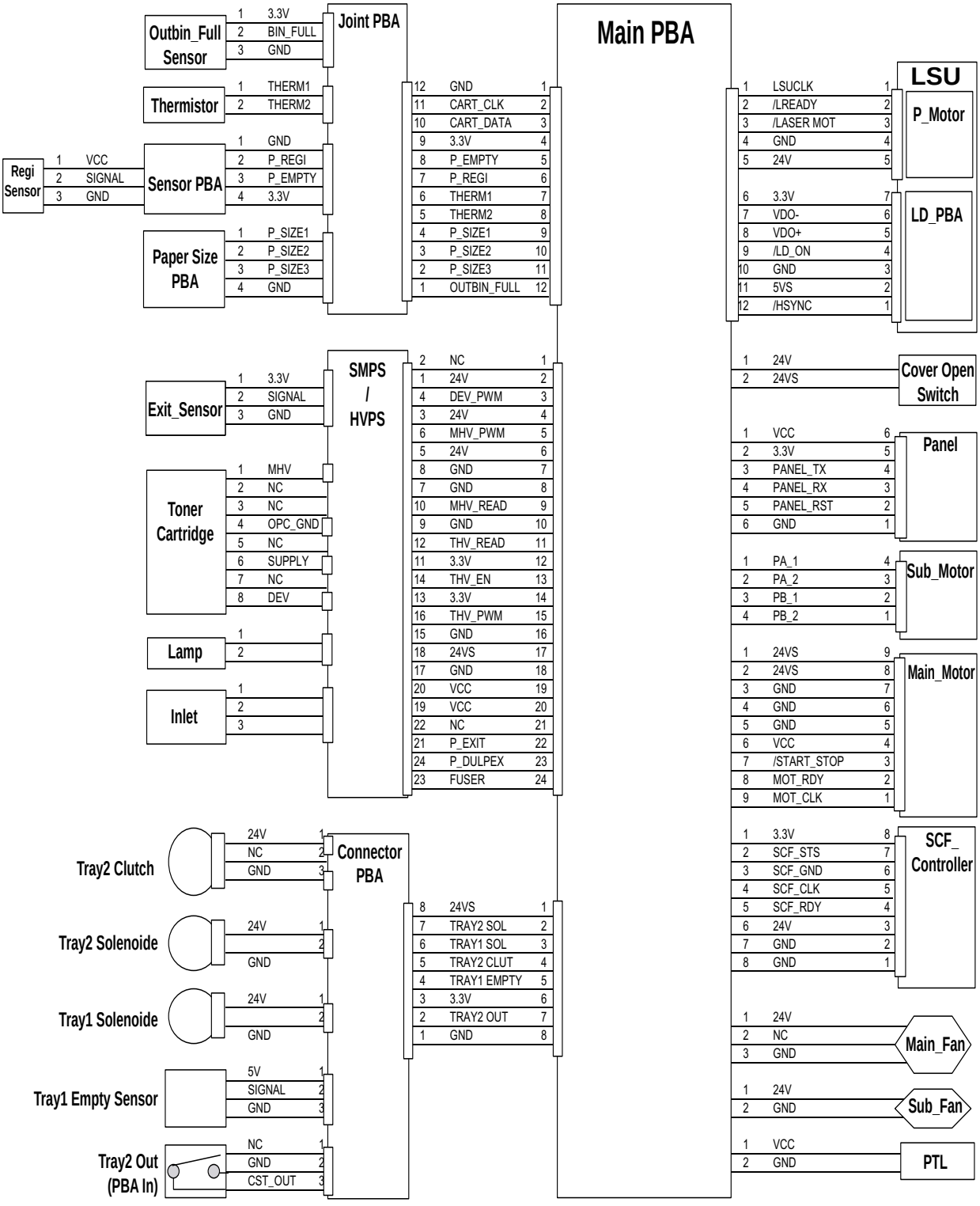
9.1 System Block Diagram



9.2 Network Block Diagram



10. Connection Diagram



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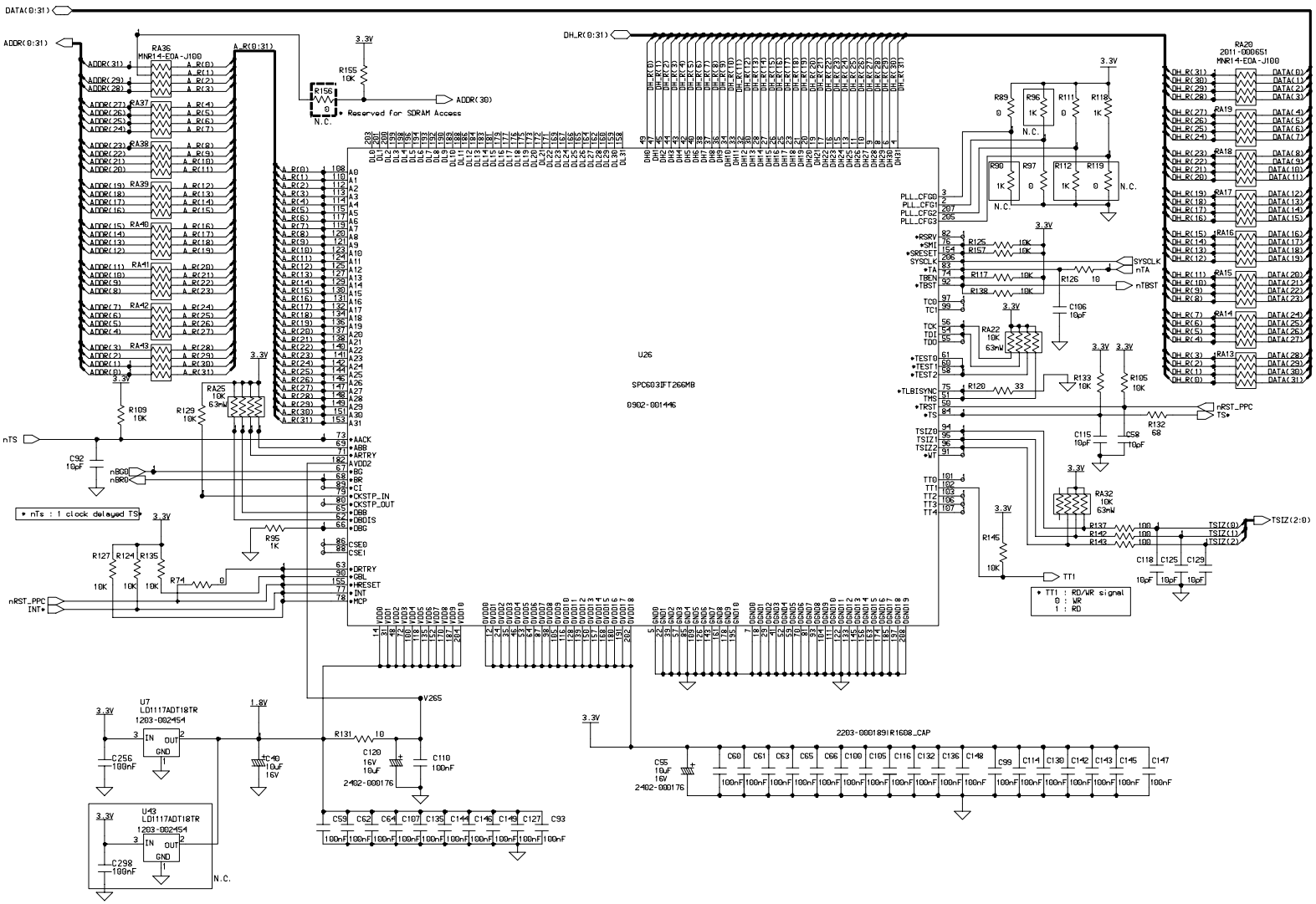
11. Schematic Diagrams

11.1 Main Board(1/9)



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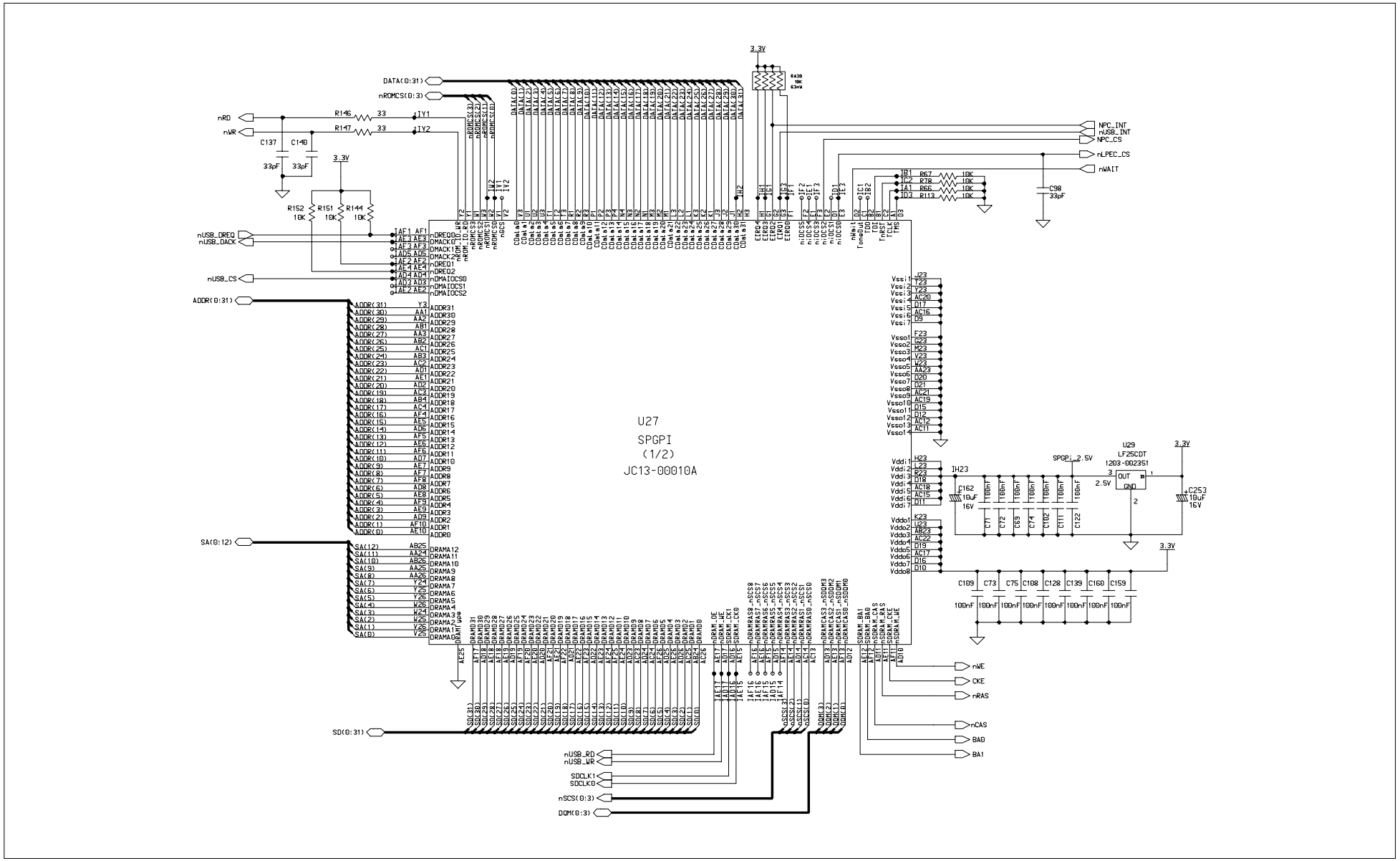
Main Board(2/9)



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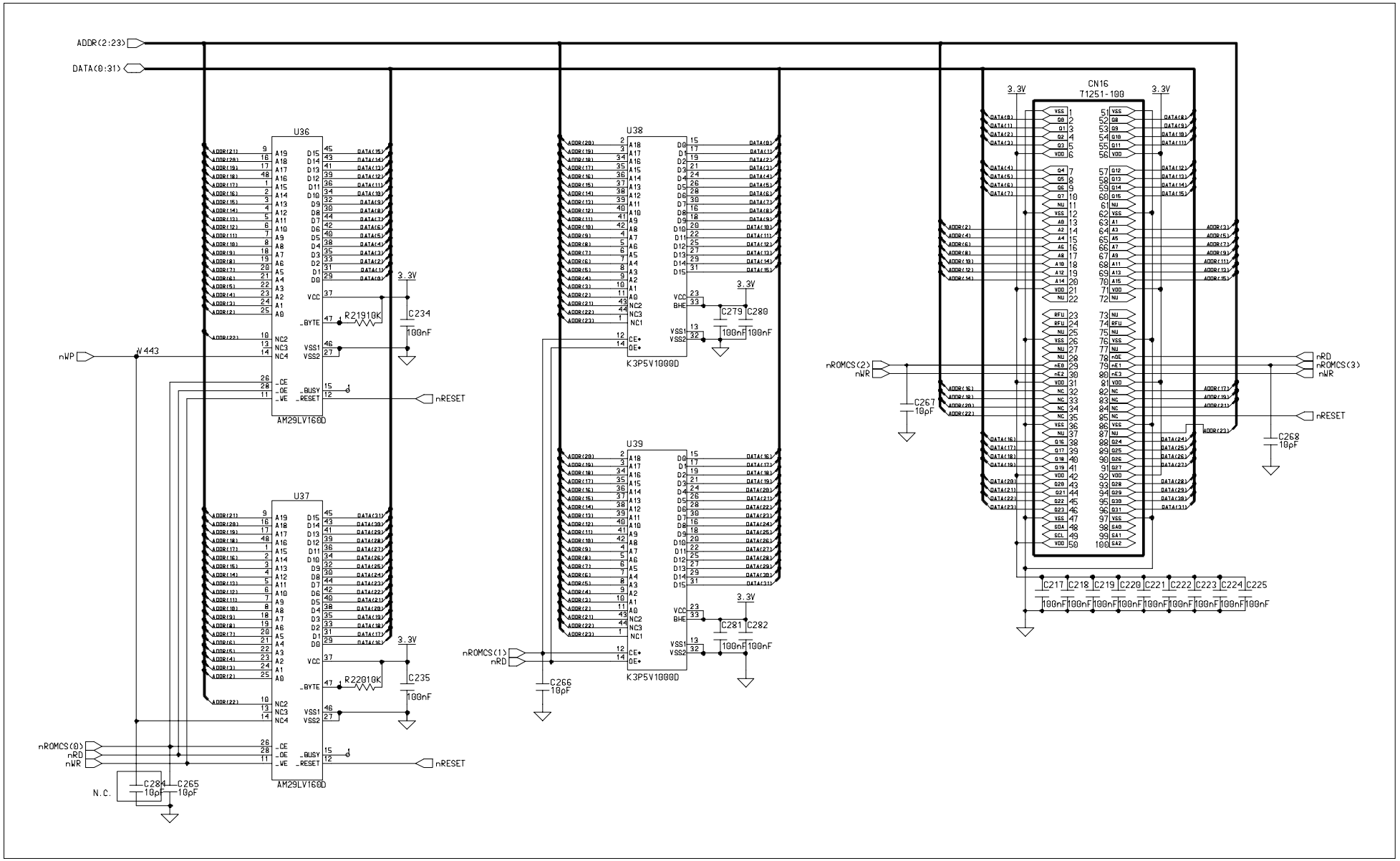
Main Board(3/9)



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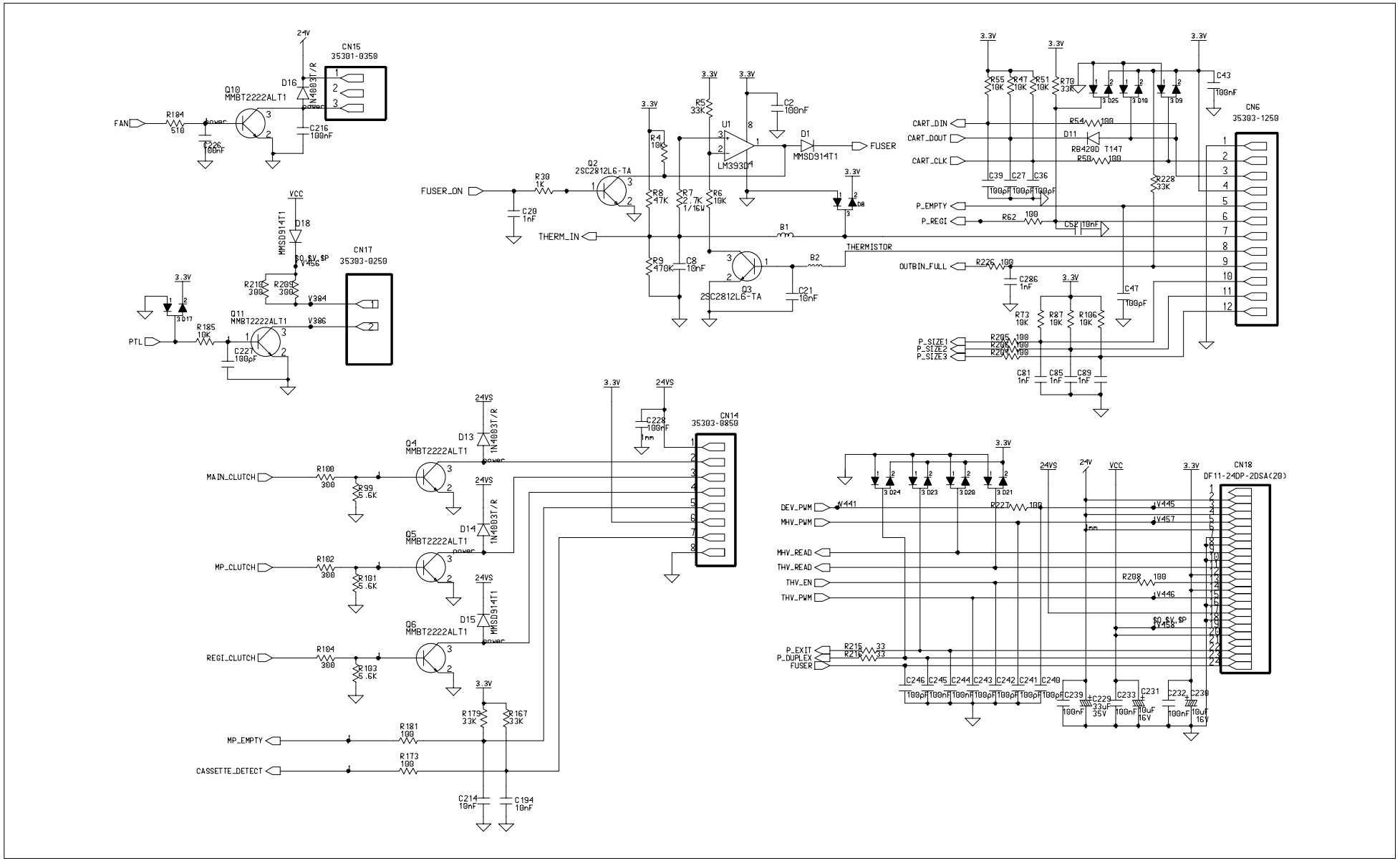
Main Board(4/9)



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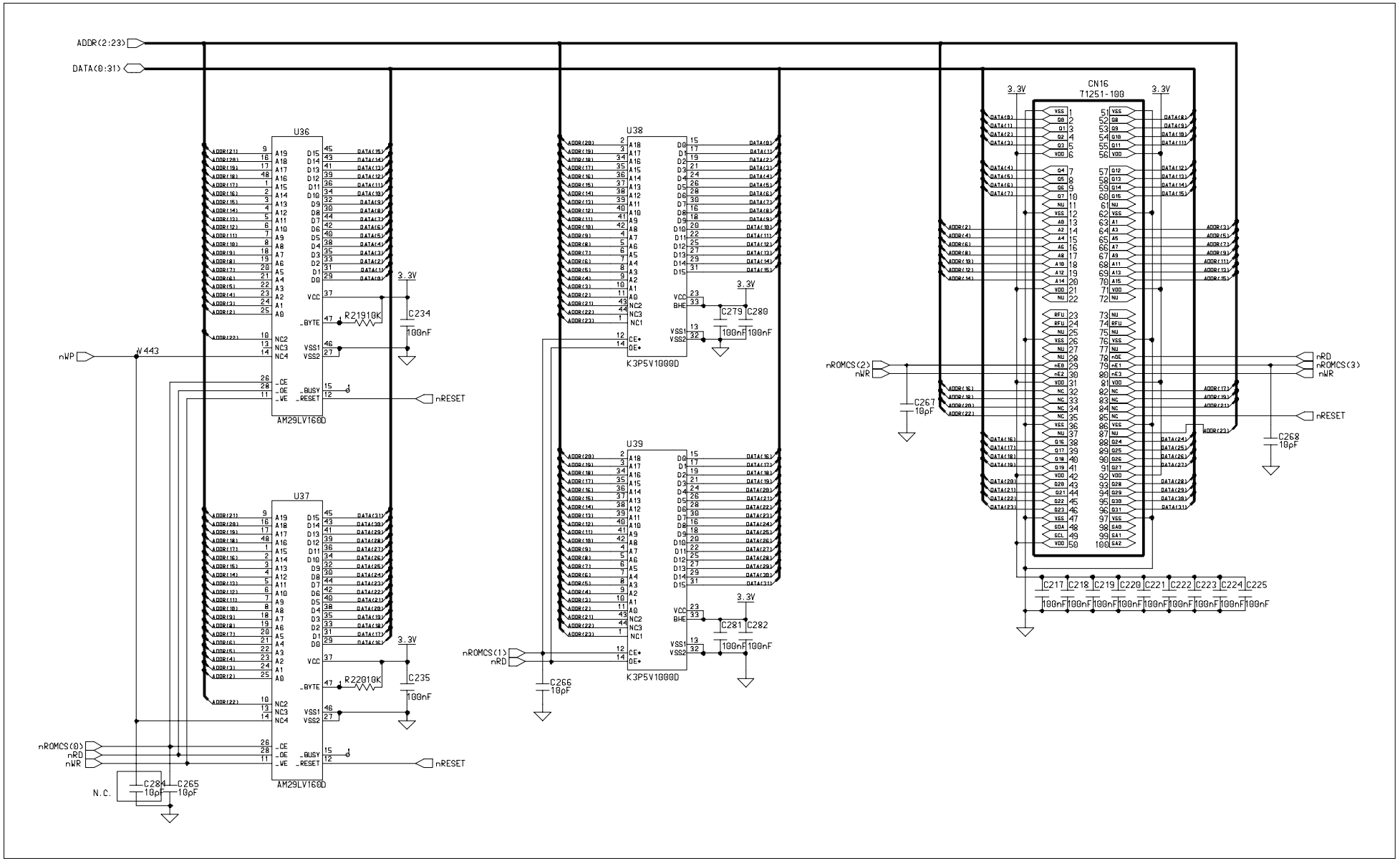
Main Board(5/9)



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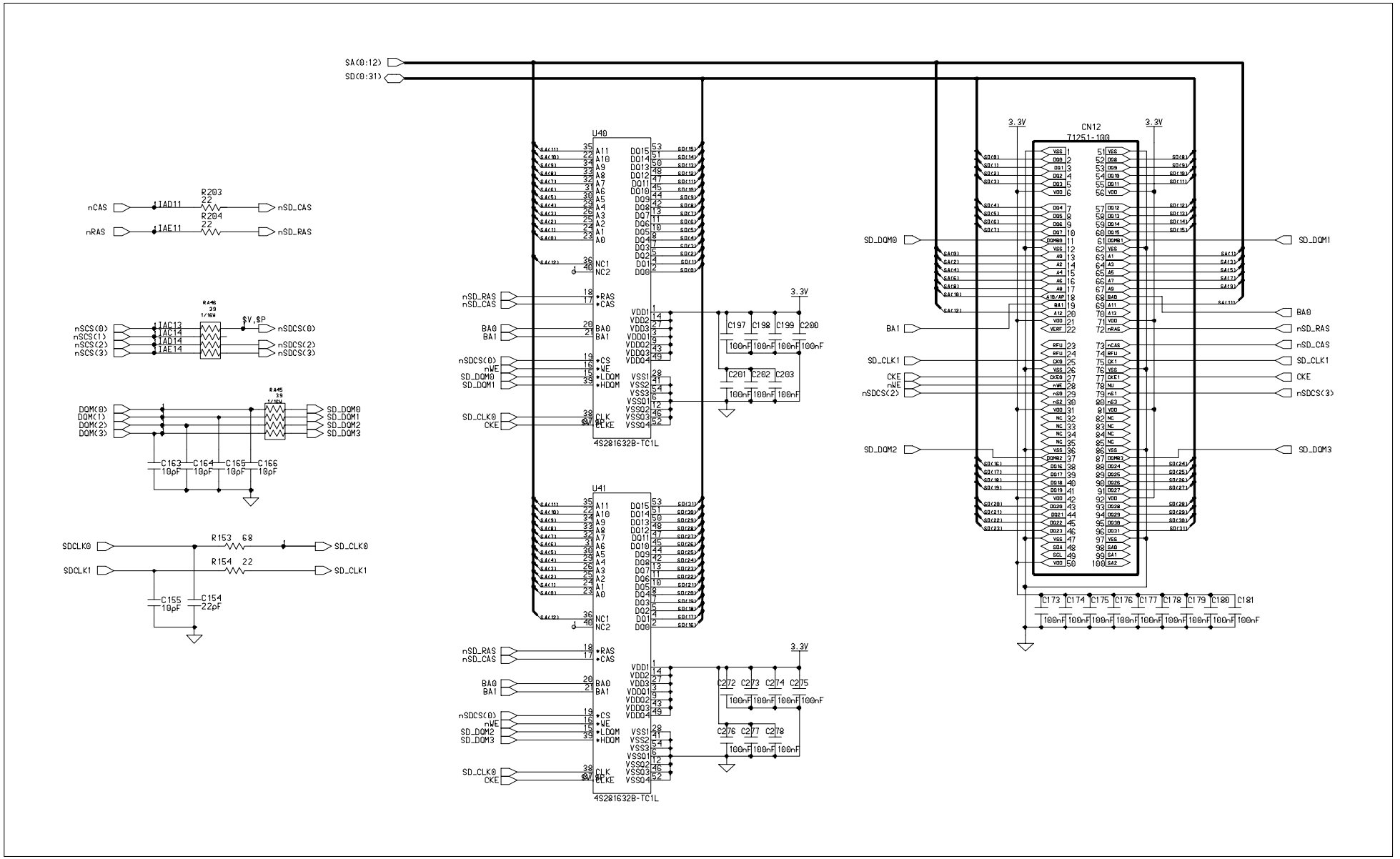
Main Board(6/9)



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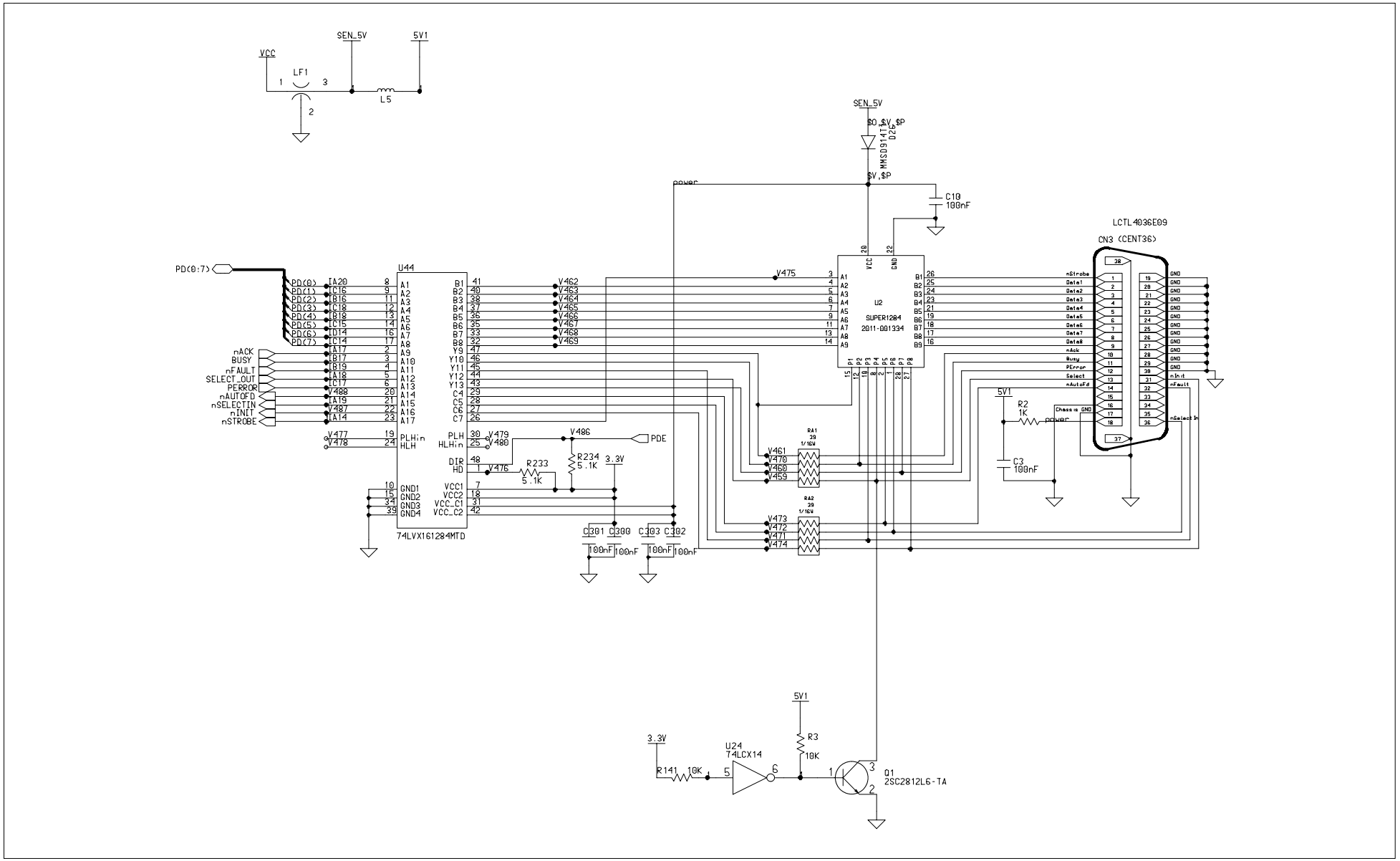
Main Board(7/9)



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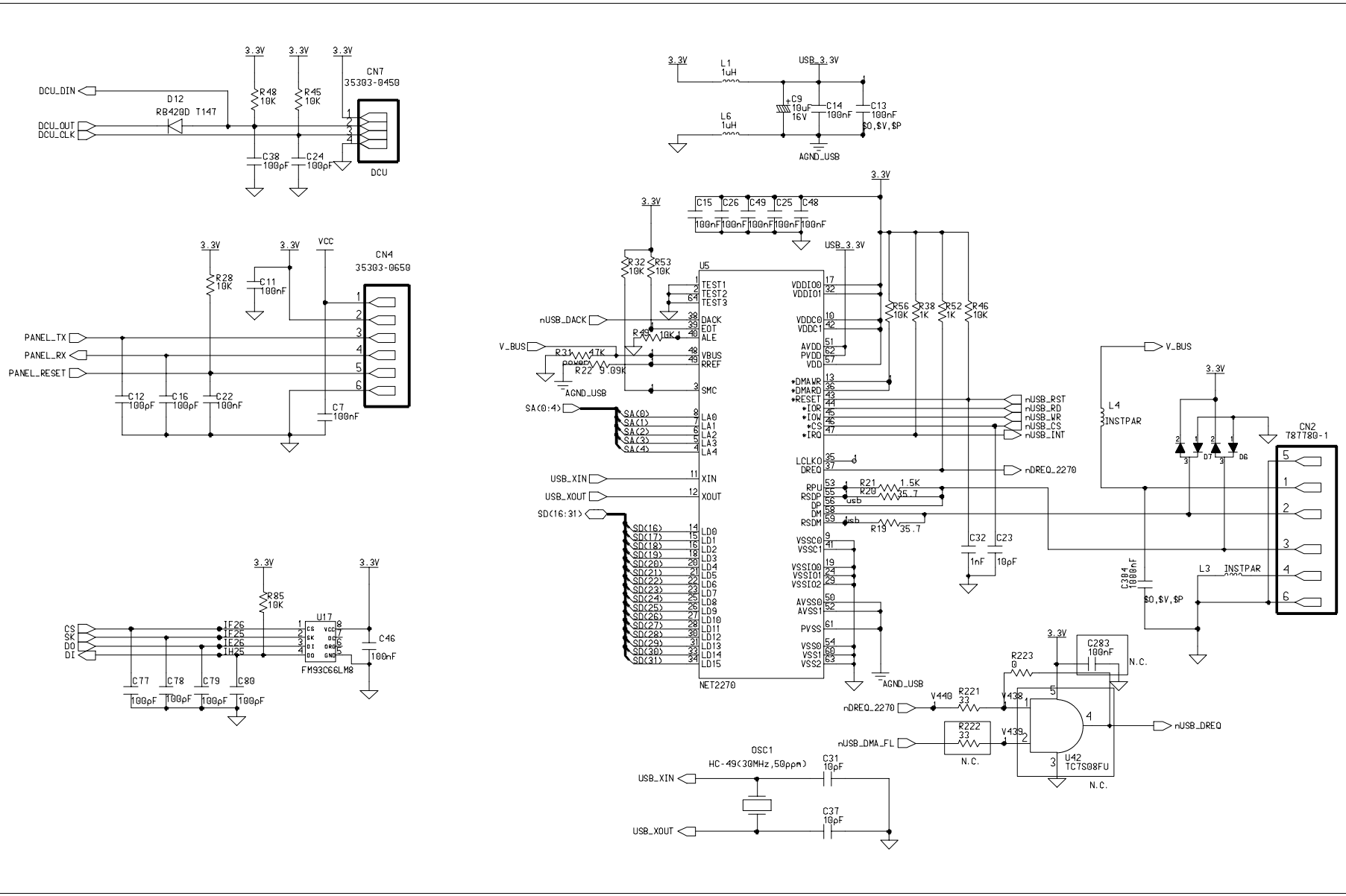

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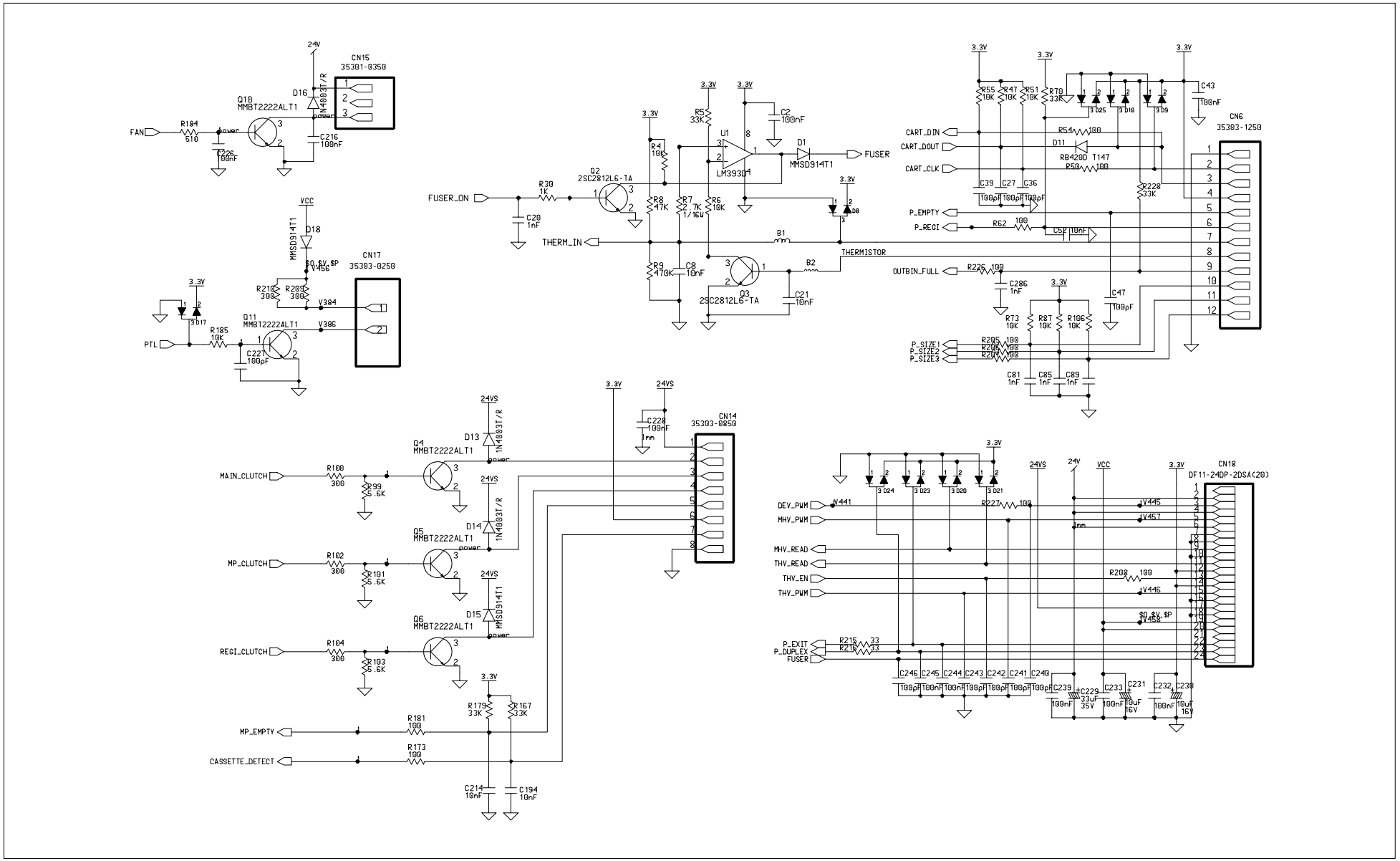
Main Board(9/9)



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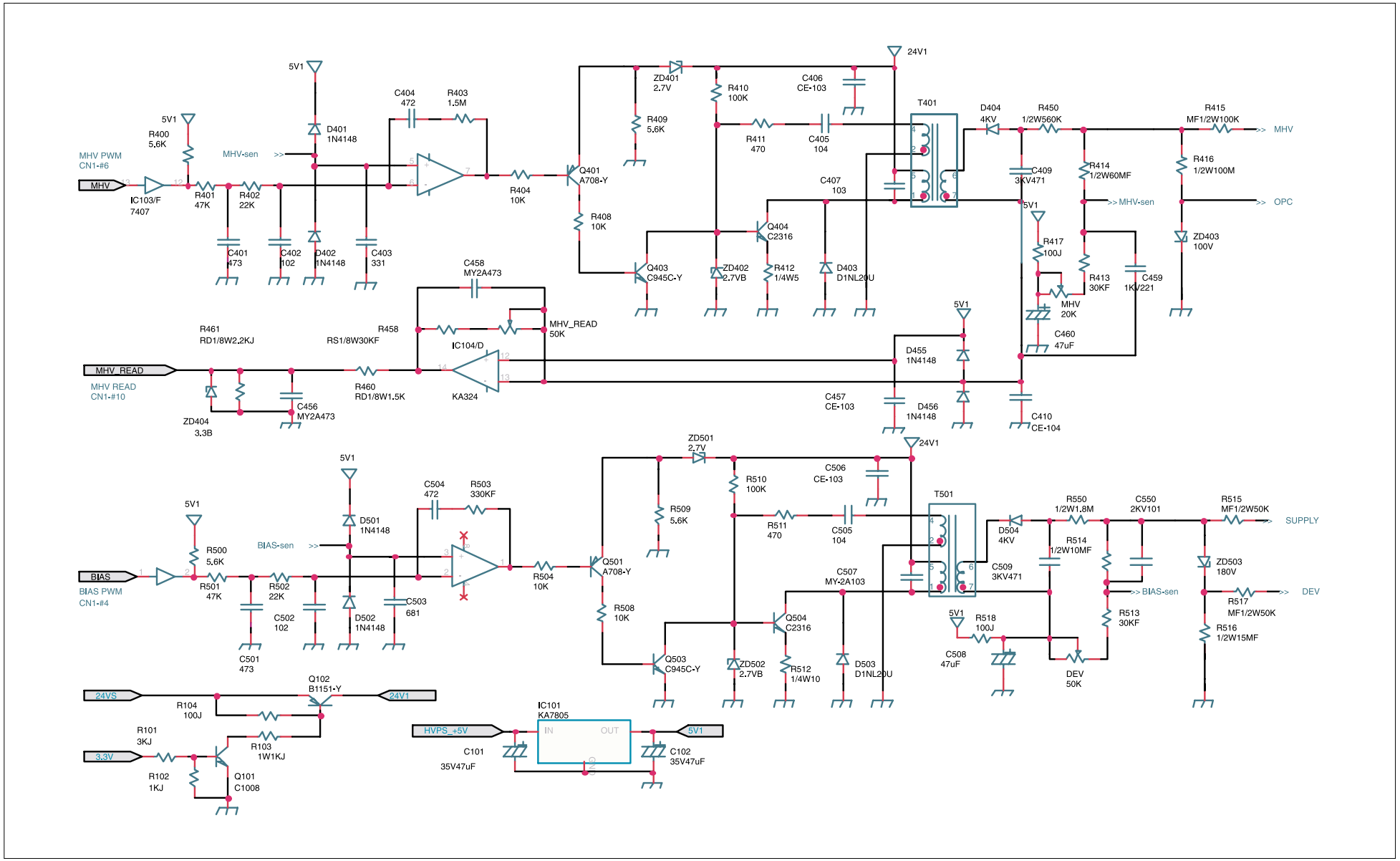
11-2 HVPS Circuit Diagram(1/2)



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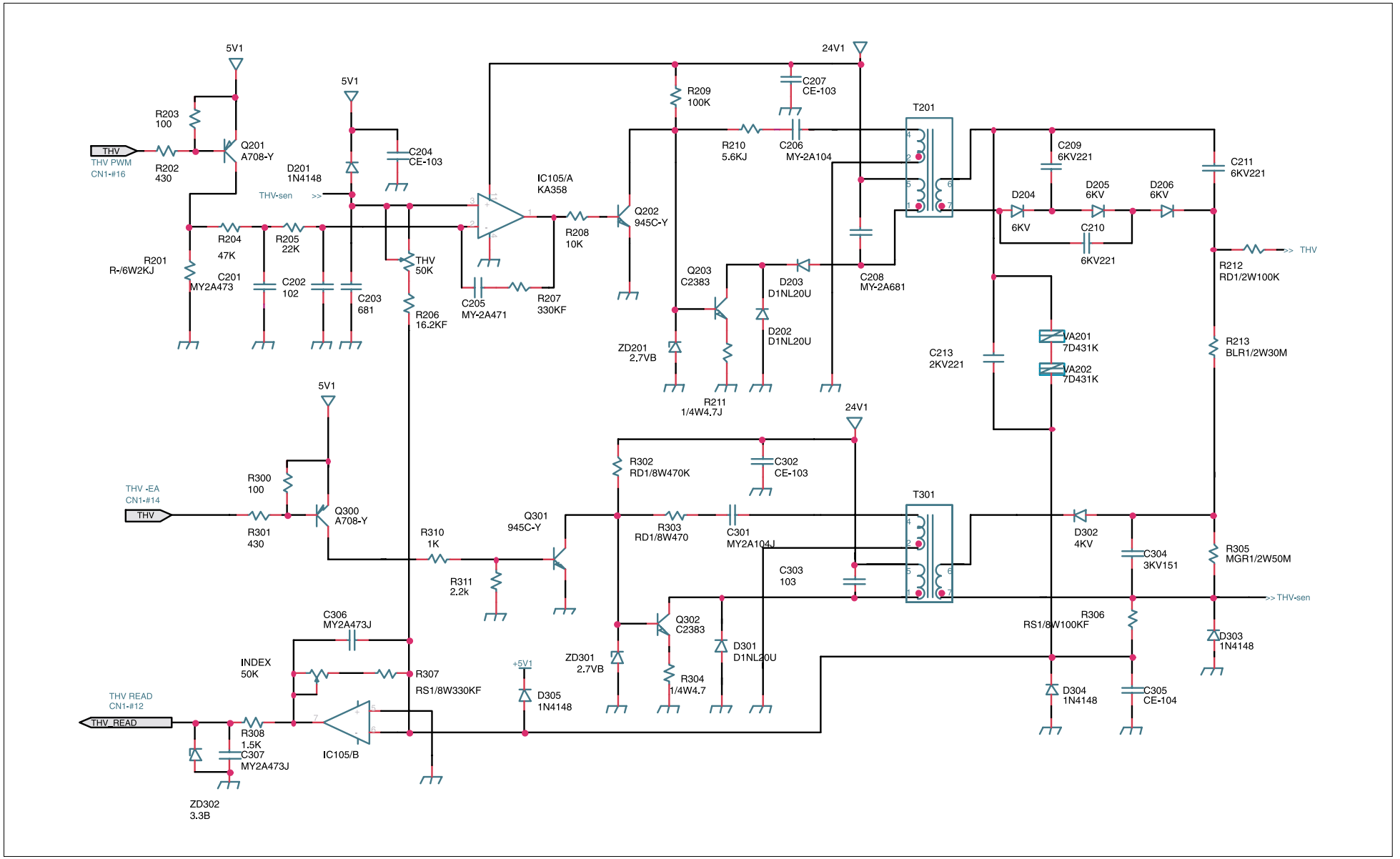
HVPS Circuit Diagram(2/2)



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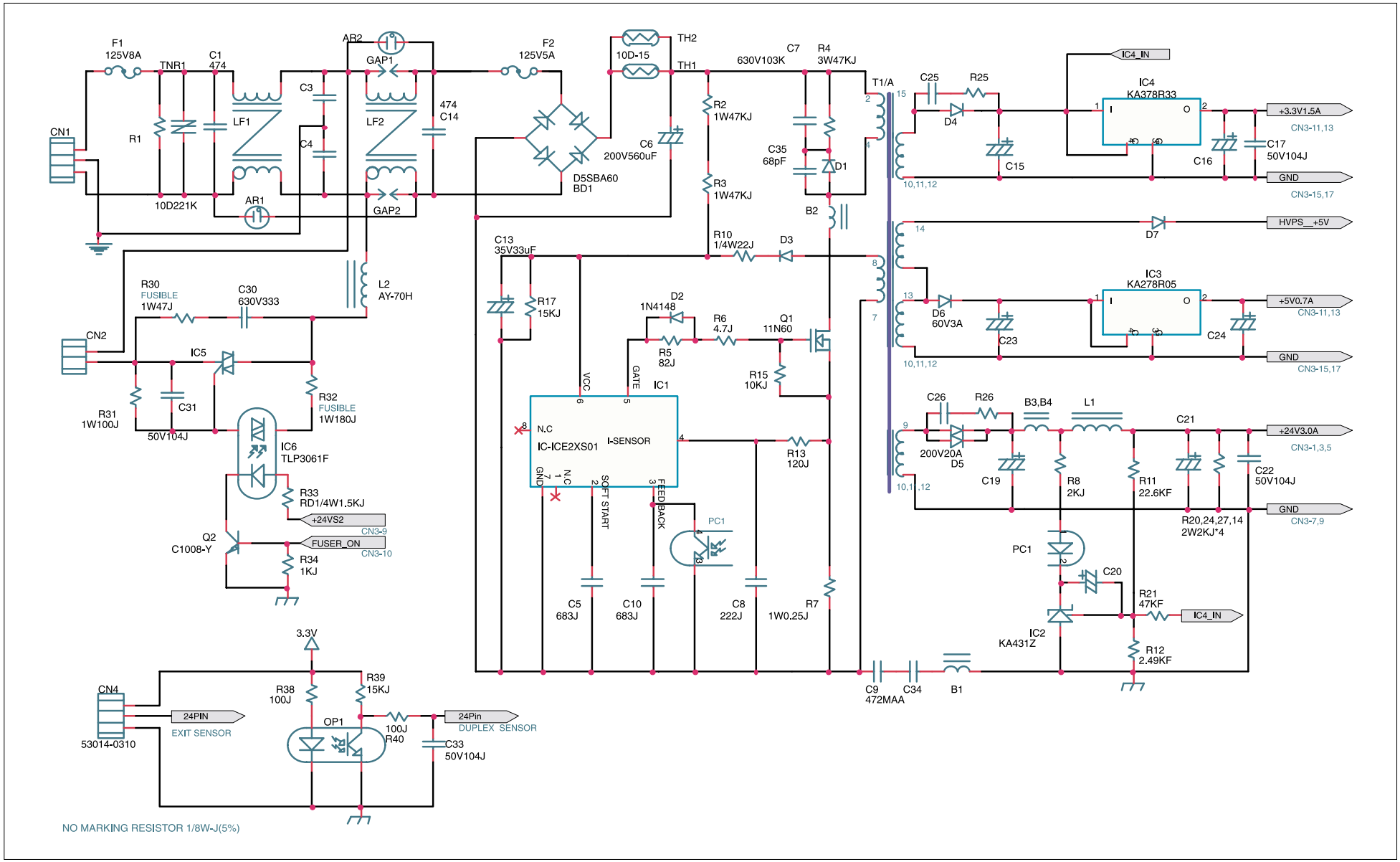
11-3 SMPS Circuit Diagram(110V)



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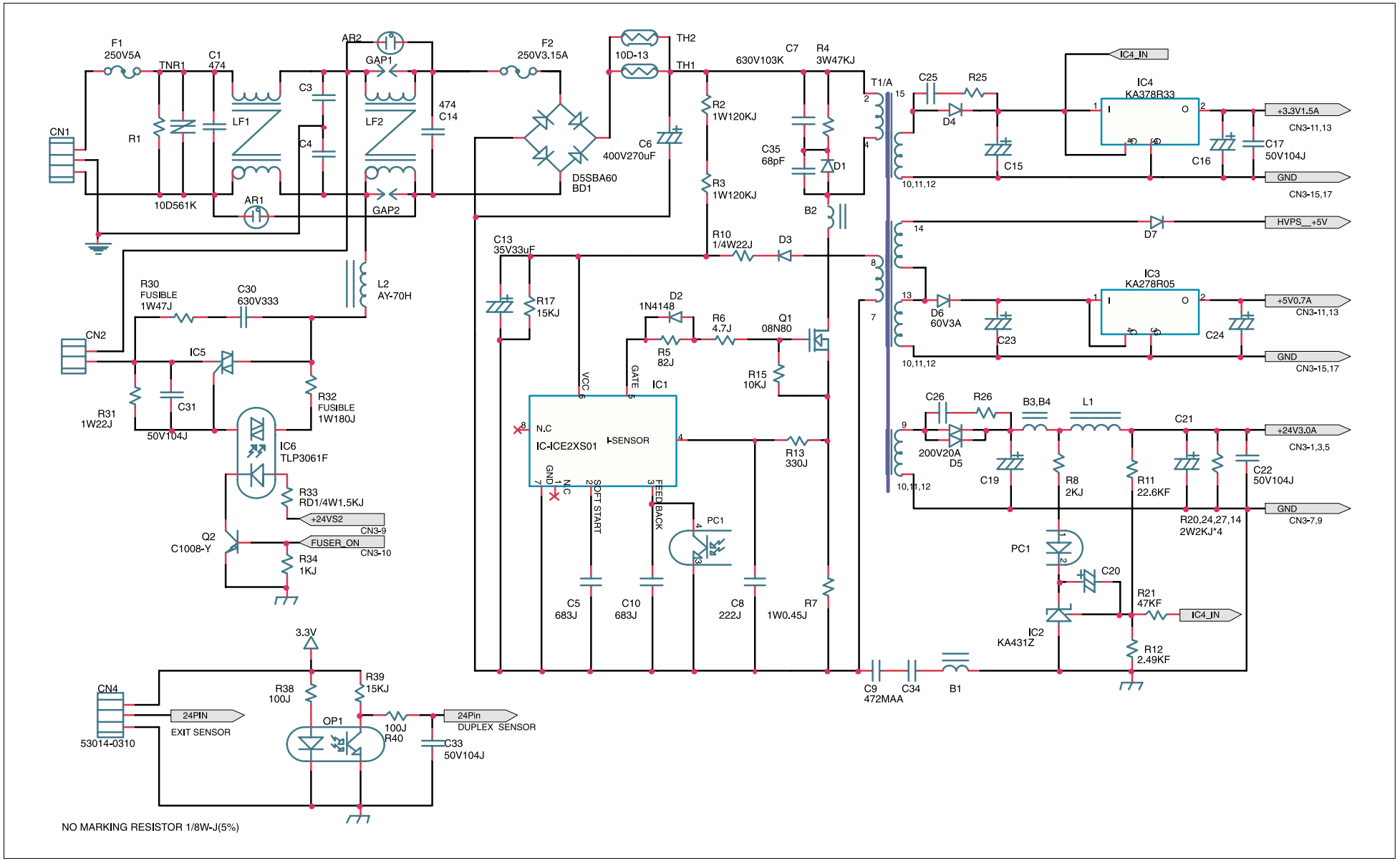
SMPS Circuit Diagram(220V)



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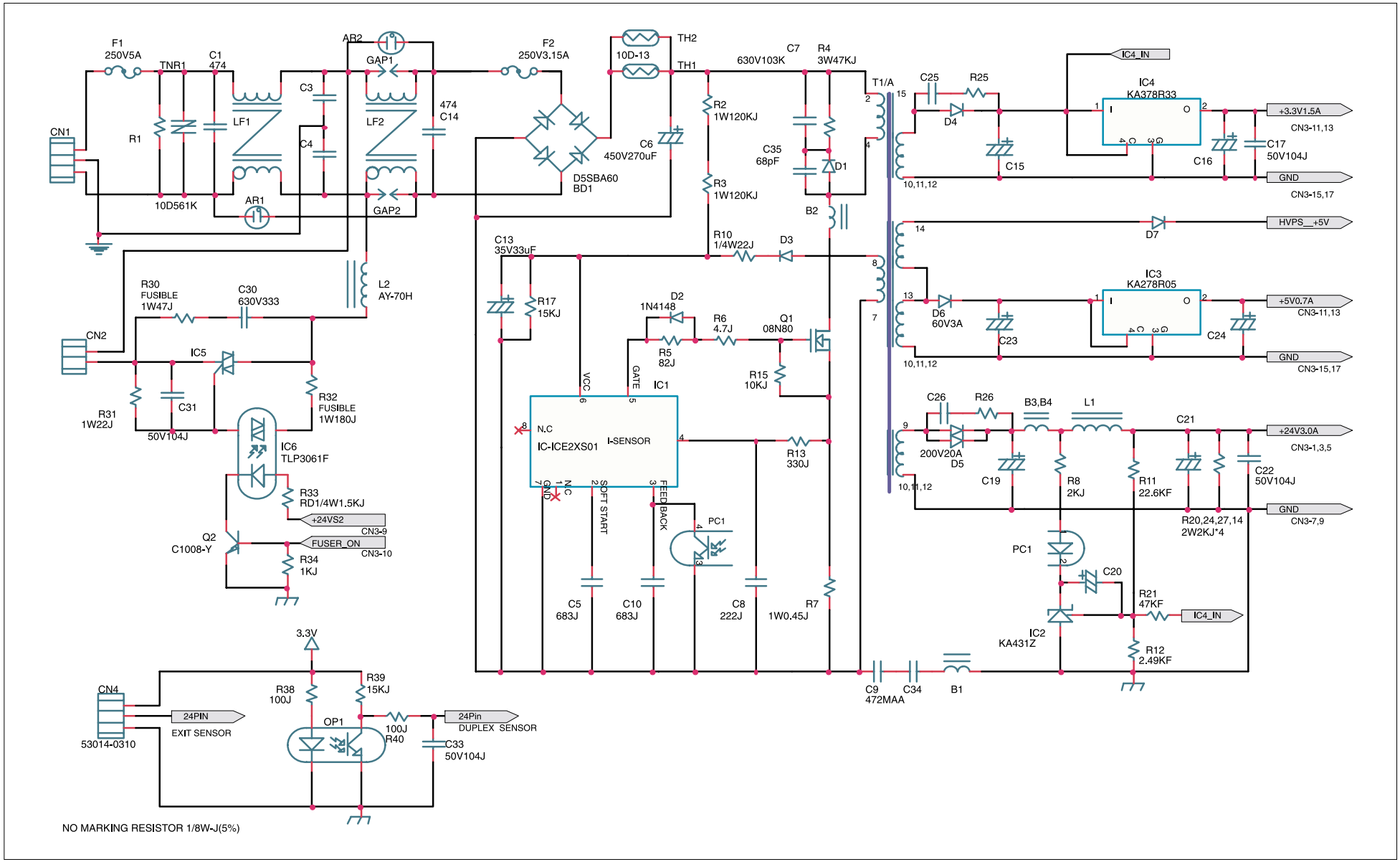
SMPS Circuit Diagram(220V for China)



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11-4 Network Card Circuit Diagram / NPC for Embedded MAC(ML-2551N)

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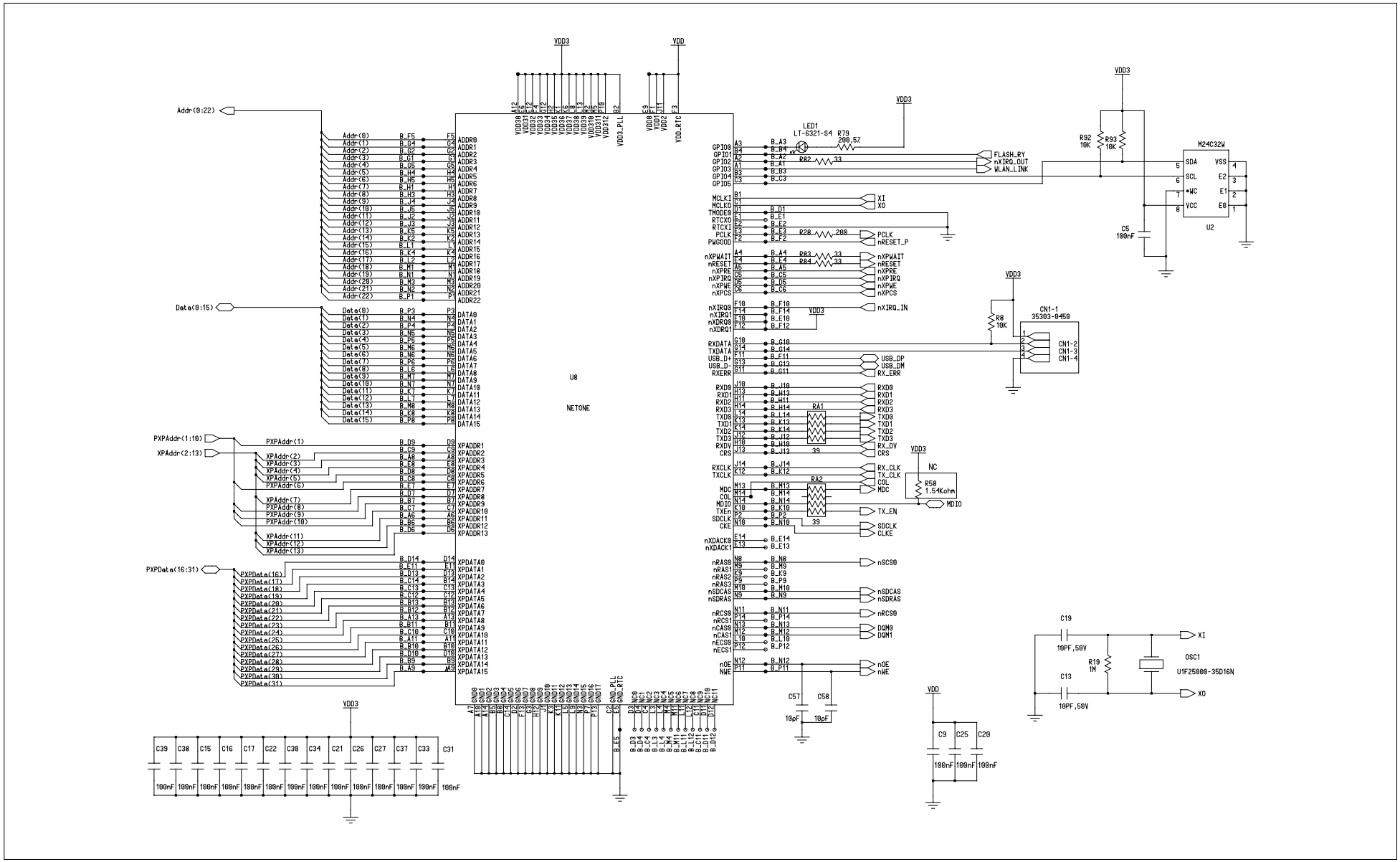
NPC3_VE(ML-2552W) 1/5



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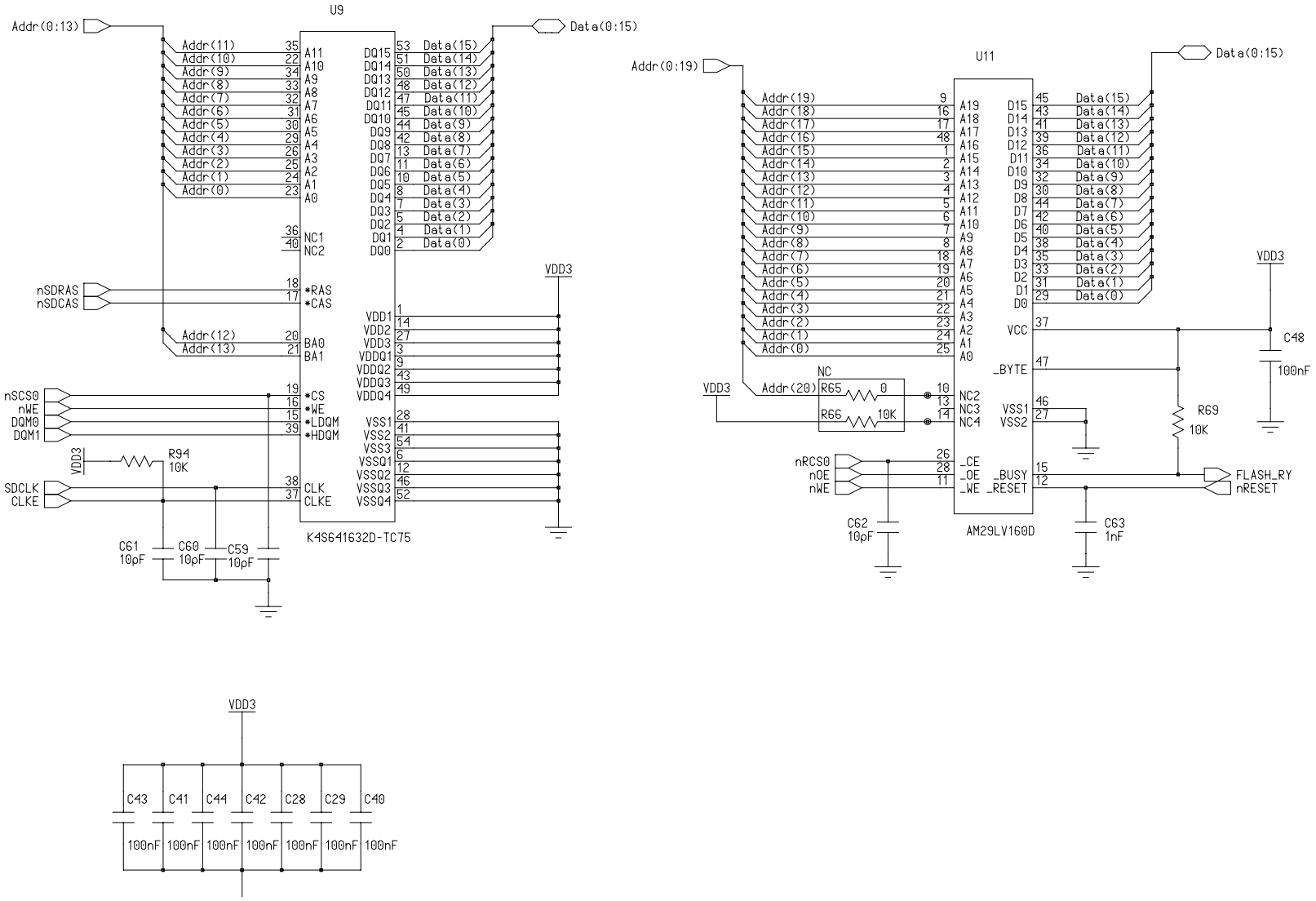
NPC3_VE(ML-2552W) 2/5



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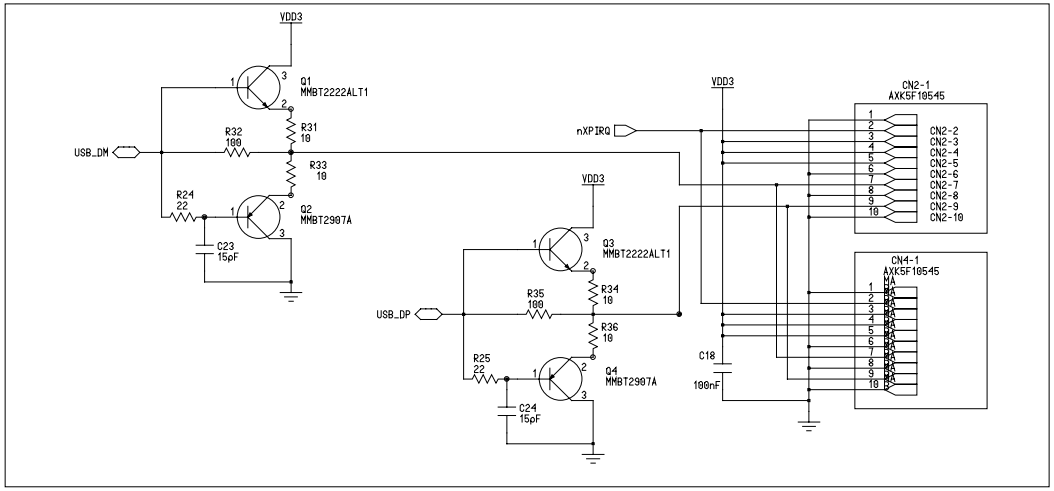
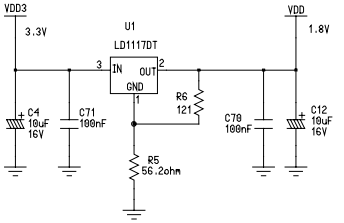
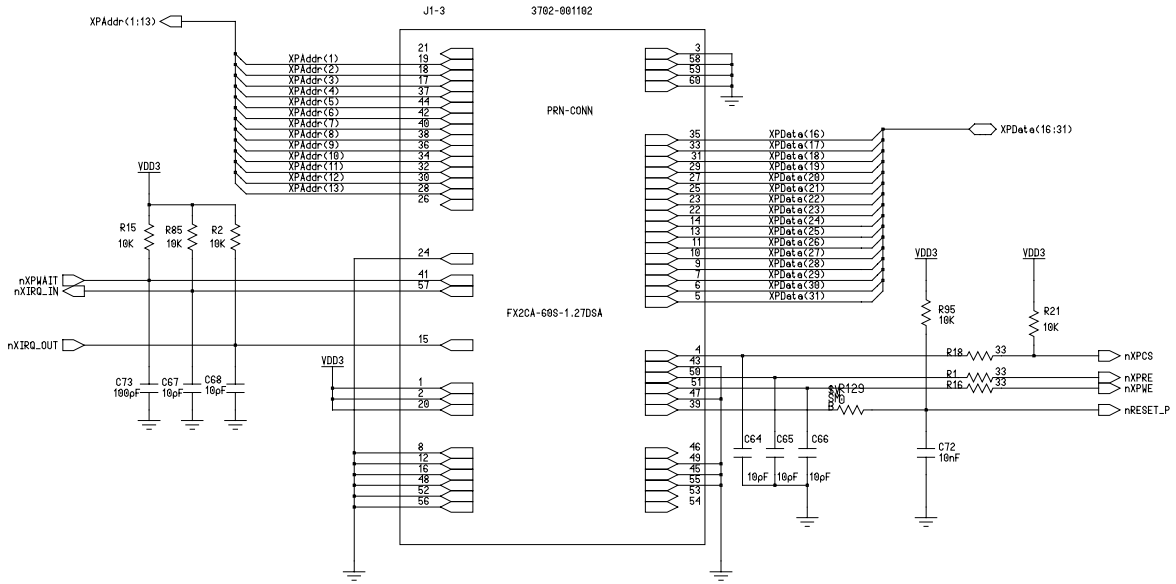
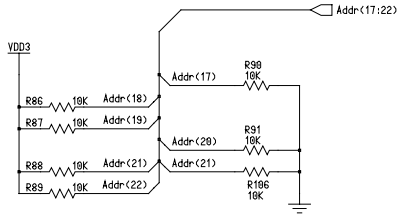
NPC3_VE(ML-2552W) 3/5



Addr17	0	PLL ON	PLL ON
	1	PLL OFF	
Addr18	0	DEBUG	NORMAL
	1	NORMAL	
Addr19	0	8BIT	16BIT
	1	16BIT	
Addr20	0	XP I/F	XP I/F
	1	IEEE1284	
Addr21	0	USB Disable	USB Enable
	1	USB Enable	
Addr22	0	EDO DRAM	SDRAM
	1	SDRAM	







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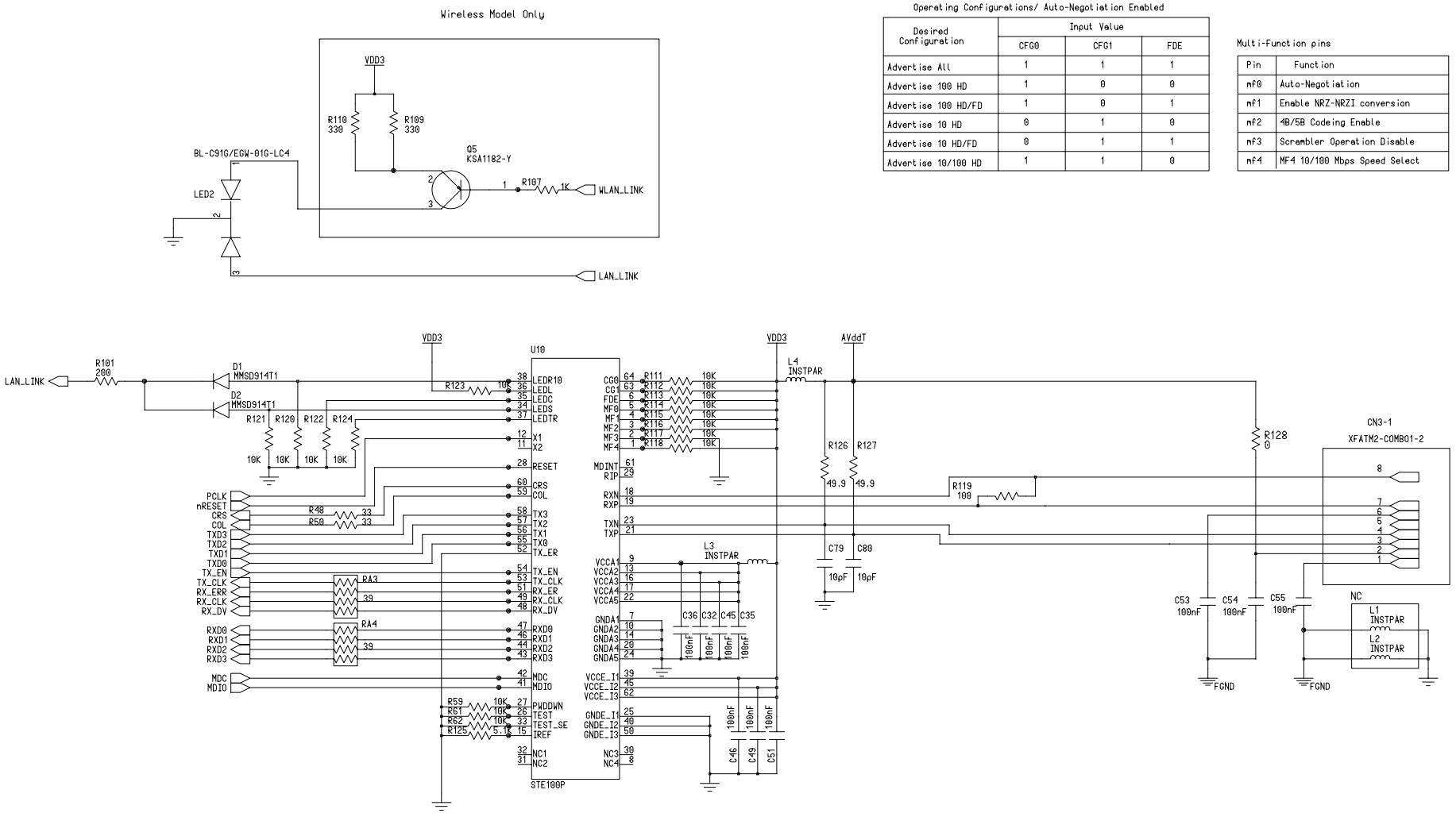
NPC3_VE(ML-2552W) 4/5



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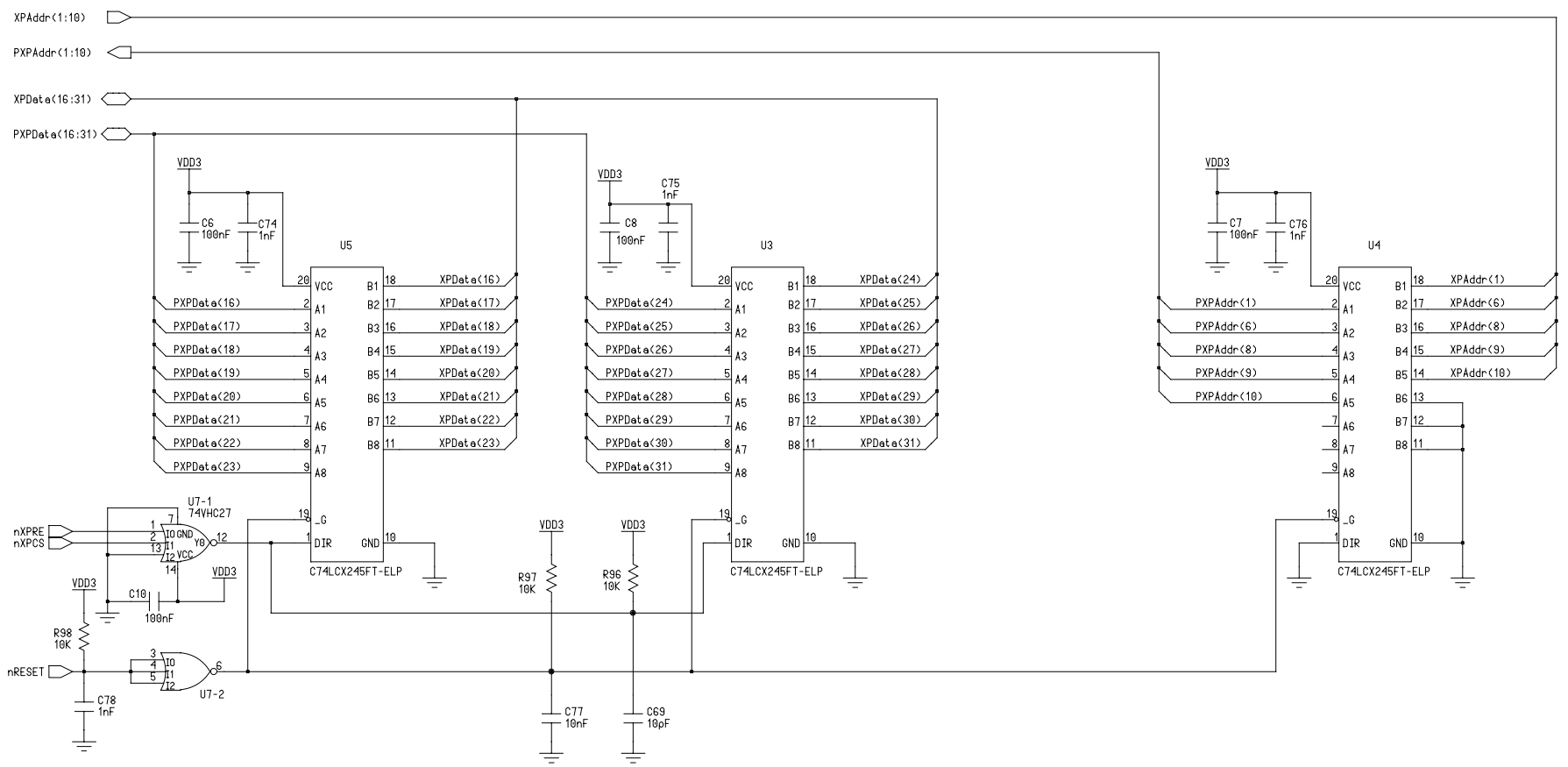
NPC3_VE(ML-2552W) 5/5



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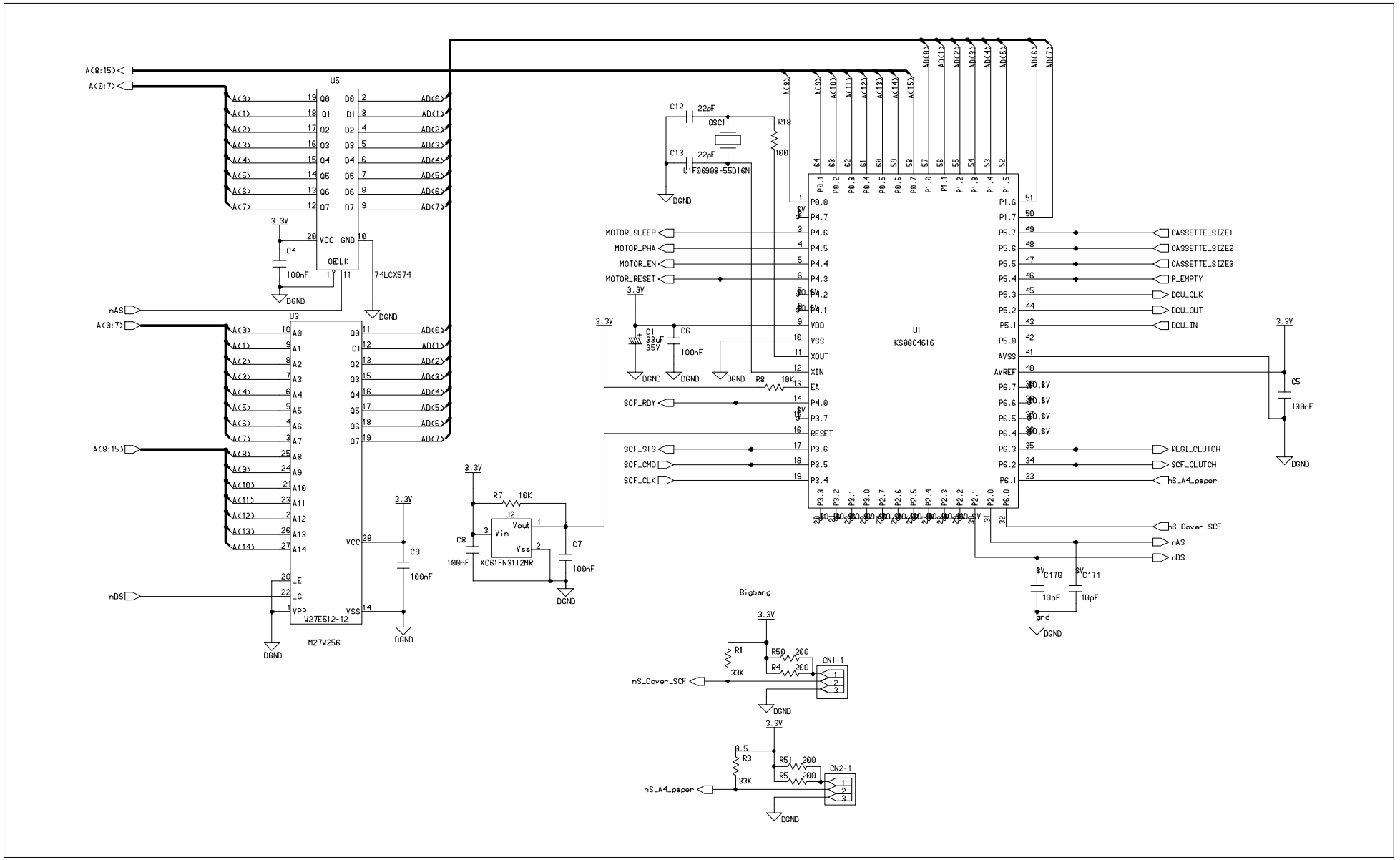
11-5 SCF PBA Circuit Diagram(1/2)



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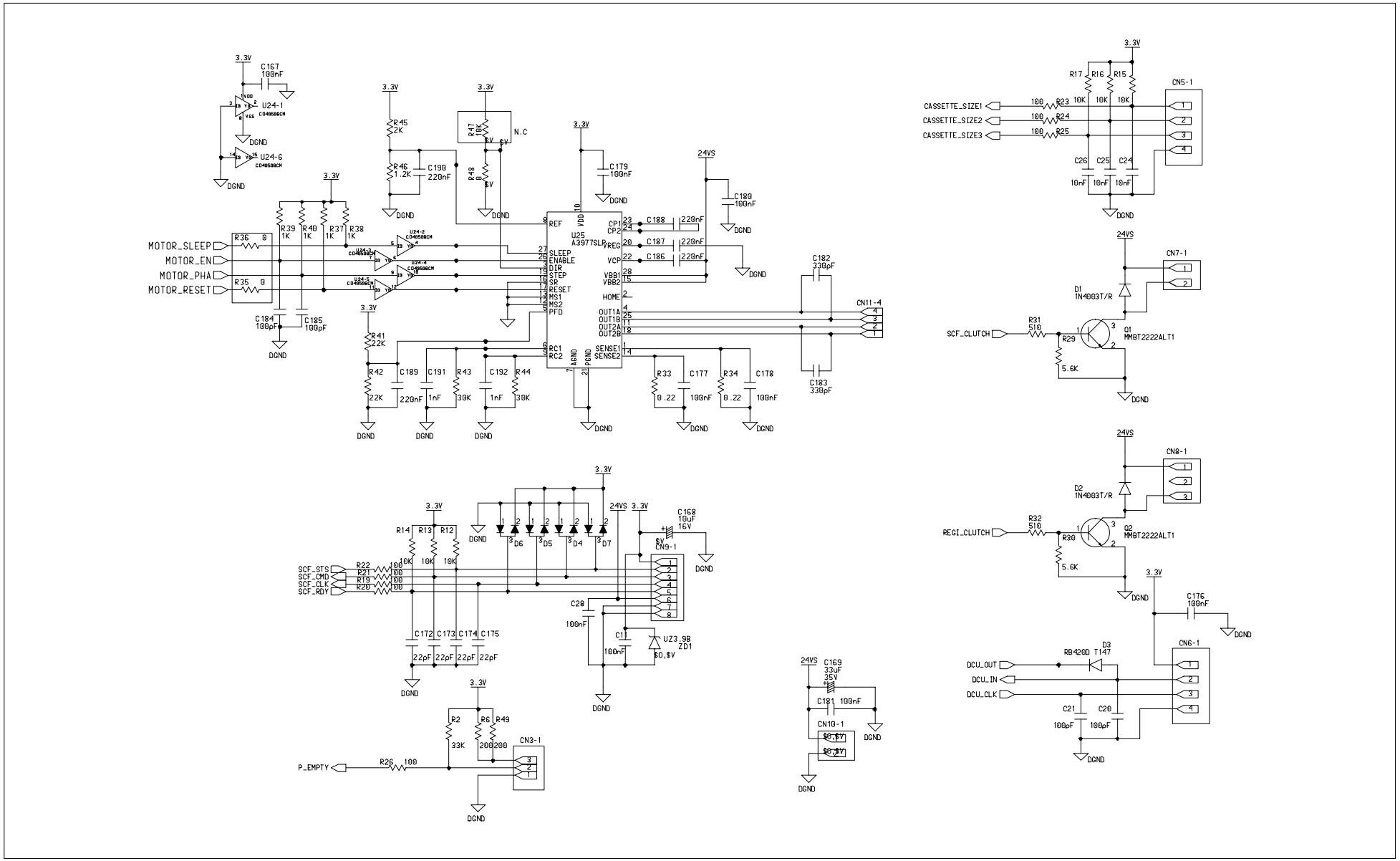
SCF PBA Circuit Diagram(2/2)



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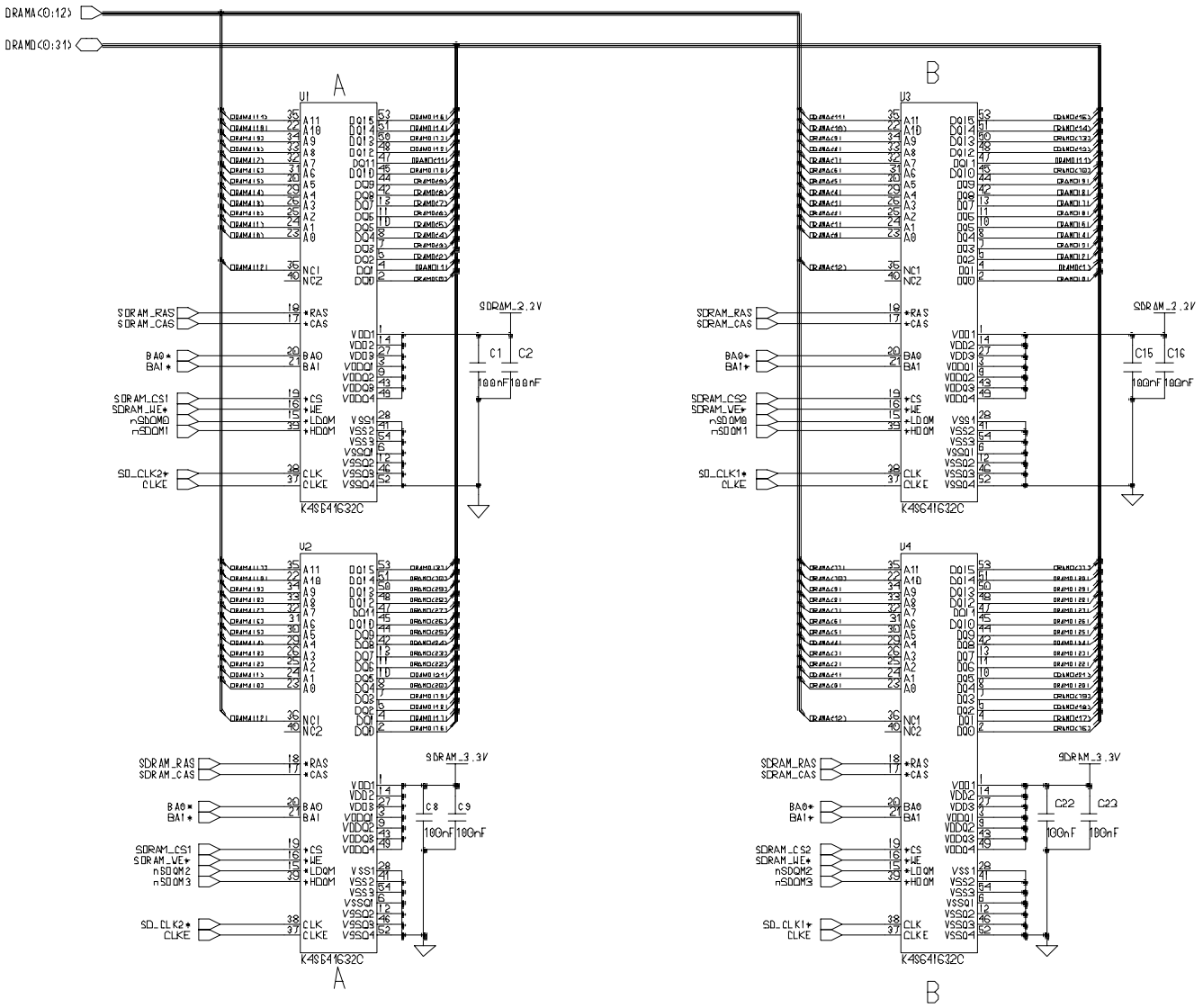
11-6 RAM DIMM Circuit Diagram(1/2)



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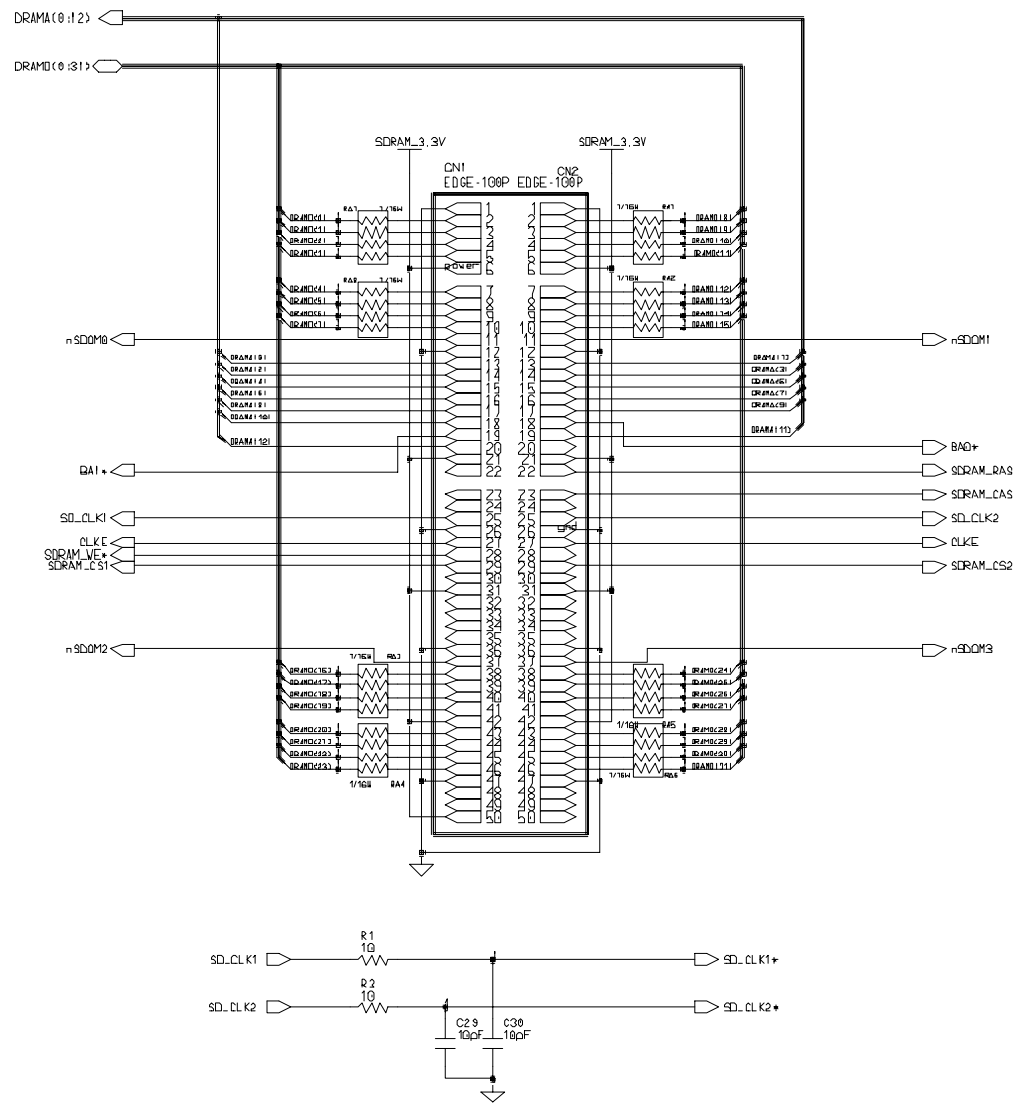
RAM DIMM Circuit Diagram(2/2)



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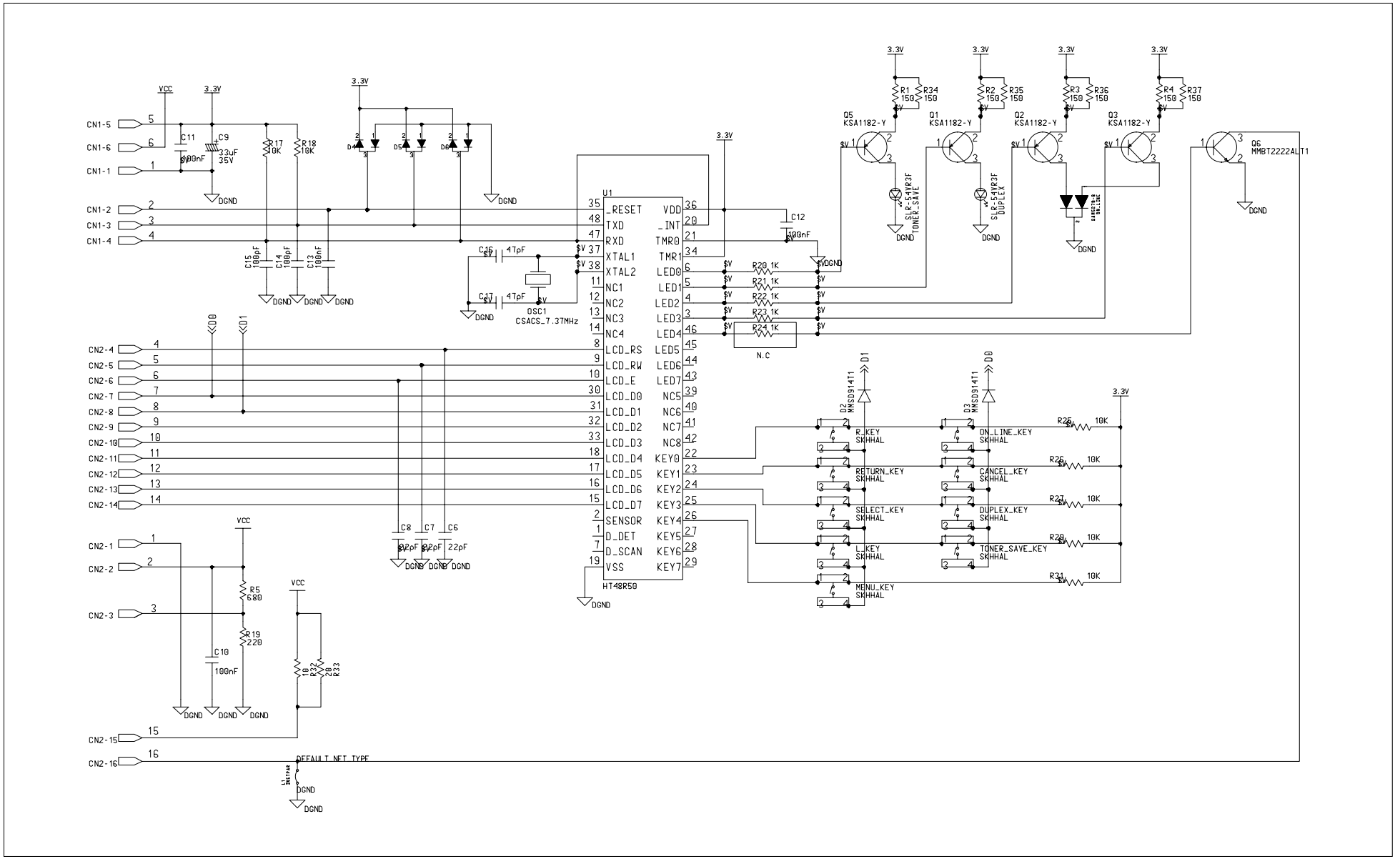
11-7 Panel PBA Circuit Diagram



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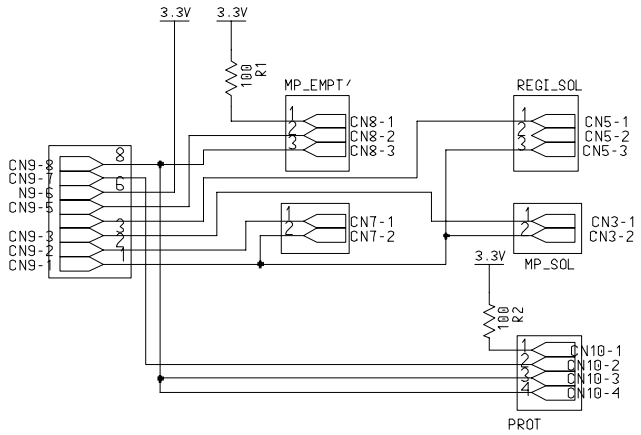
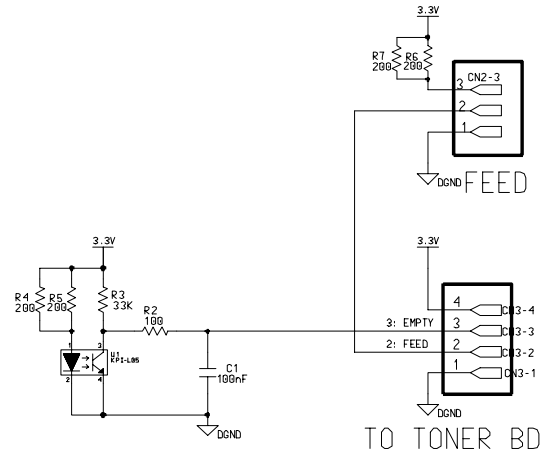
11-8 Connector PBA Circuit Diagram



11-9 Cover Open Sensor Circuit Diagram



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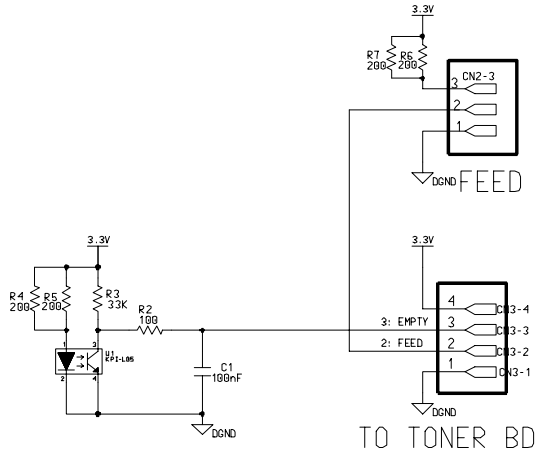
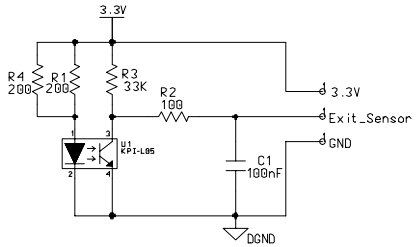
11-10 Enpty Sensor Circuit Diagram



11-11 Exit Sensor Circuit Diagram



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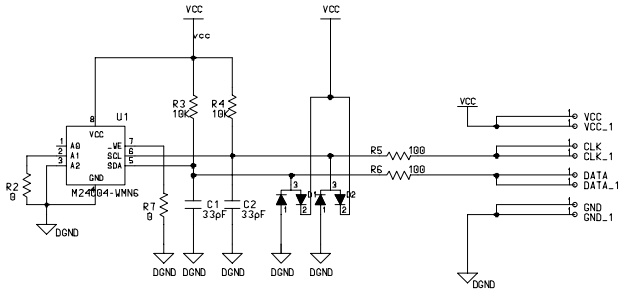
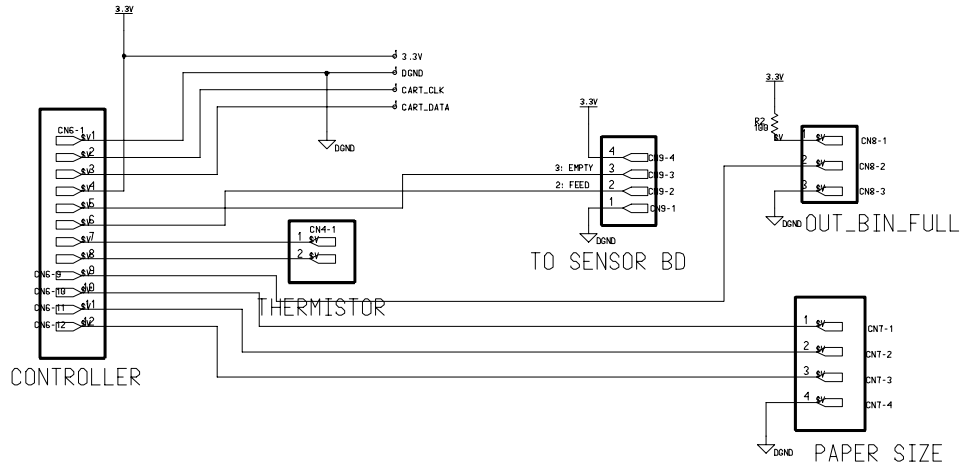
11-12 OPC PBA Circuit Diagram



11-13 Toner PBA Circuit Diagram



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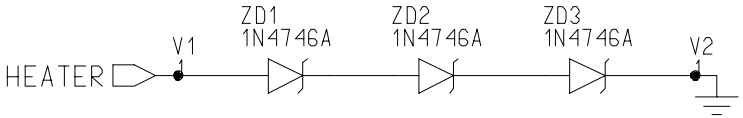
11-14 Zener PBA Circuit Diagram



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